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ABSTRACT

Addressed are the history, present status and future challenges of environmental communication, defined as "the process of planning, producing and dissemination, or conducting research related to, written, spoken and/or pictorial messages about the environment, environmental issues and/or environmental management." The focus of this monograph is the relationship of environmental communication to the environmental movement and the mainstream of general mass and interpersonal communication. Included are an analysis of various approaches and communications media, a case study, and a summary of how research in various behavioral and resource management fields can apply to environmental communication. Over 200 references comprise the bibliography. (Author/WB)

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The Environmental Communication Ecosystem: A Situation Report

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ENVIRONMENTAL EDUCATION INFORMATION REPORTS

Environmental Education Information Reports are issued to analyze and summarize information related to the teaching and learning of environmental education. It is hoped that these reports will provide information for personnel involved in development, ideas for teachers, and indications of trends in environmental education.

Your comments and suggestions for this series are invited.

John F. Disinger
Associate Director
Environmental Education

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FOREWORD

Environmental Education, variously defined, has at least three main aspects or modes:

Environmental Education per se--Relatively formal programs aimed at developing a citizenry that is knowledgeable concerning the environment and its associated problems, aware of how to help solve those problems, and more or less motivated to work toward their solutions.

Environmental Studies--Those interdisciplinary, scientific, content-based considerations which are inherent to any understanding of the environment, its workings, and its problems.

Environmental Communication--The sum of those portions of the total relatively informal information flow in the social system that have a common environmental content.

This Monograph is an attempt to analyze what we know--or what we don't know--about that point at which communication and environmental issues impinge--yesterday, today, and tomorrow. In a sense, it is an interpretation of an earlier ERIC/SMEAC publication, An Annotated Bibliography of Environmental Communication Research and Commentary: 1969-79, by Renee Guillierie and A. Clay Schoenfeld, 1979.

The author's association with what is now called environmental communication dates at least from 1948, when his investigative reporting of the damage to duck breeding grounds in the Dakotas led to national concern about competing uses of land--a case history he records in this Monograph. In 1969, he was the Founding Editor of The Journal of Environmental Education. He was a progenitor of Earth Day: April 22, 1970.

But perhaps his most lasting contribution to the field has been the pioneering master's degree program in environmental communication that he and his colleagues have developed since 1967 at the University of Wisconsin-Madison to polish young ecologists with a bent toward interpretation or young journalists with a bent toward environmental studies. Graduates of that program are now media staff members on Audubon, National Wildlife, and the Chicago Sun-Times; with such state and federal resource management agencies as the National Park Service, the USDA Forest Service, the Bureau of Land Management, and the Wisconsin Department of Natural Resources; with such environmental organizations as the Wildlife Management Institute, the Center for Appropriate Technology, and the American Chemical Society; with Trane Engineering, CUNA International, and other resource industries, with nature centers, museums, libraries, and agricultural extension; and particularly in spin-off environmental communication programs at Colorado State University, Humboldt State, Kansas State, Marquette University, Ohio State, and the University of Washington.

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Presently Professor Schoenfeld is President of the National Association for Environmental Education and a member of the Board of Directors of the American Forestry Association. With John C. Hendee, his recent Wildlife Management in Wilderness is now in its second edition, and the second edition of his Effective Feature Writing will be published this year. He is the author or editor of 14 other books.

While portions of this Monograph have appeared previously in journals of communication, education, resource management, and the social and environmental sciences, this is the first time the author has synthesized a situation report on the symbiotic relationships among biological and social systems as represented by environmental communication phenomena. The bibliography alone is invaluable. This volume represents a notable contribution to the growing literature of environmental education, environmental studies, and environmental communication.

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U.S. Department of Agriculture

Washington, D.C.
January 1981

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INTRODUCTION: ENVIRONMENTAL COMMUNICATION DEFINED

Environmental communication has been said to encompass "the process of planning, producing, and disseminating, or conducting research related to, written, spoken, and/or pictorial messages about the environment, environmental issues, and/or environmental management" (170). Put another way, environmental communication is said to be the sum of those portions of the total information flow in the social system that have a common environmental content (199). Whatever their genus or species, environmental communicators could generally reach at least a grudging consensus on a definition approximately so stated with respect to the content of environmental communication. Add purpose or objective to the definition of environmental communication, however, and consensus can fly out the window. Depending on their particular niche in the environmental communication ecosystem, environmental communicators tend to view their raison d'entre through glasses of varying tints. If environmental communication phenomena are to be addressed, these varied interpretations of the purpose of environmental communication need to be recognized (150).

Environmental communicators are of course found in the media of mass communication. They tend to be of the genus "public affairs reporter." As such the majority are more or less wedded to the tenets of "objective" journalism, wherein the reporter covers "the news" with an antiseptic eye toward informing readers or viewers, and perhaps toward lifting their level of awareness, interest, and understanding, but with no conscious personal attempt to inculcate a particular opinion or attitude, much less to encouarge a commitment to individual or collective action in any particular direction.

Environmental communicators in the employ of resource management agencies, on the other hand, view environmental communication from the perspective of public relations, its objective to help create a climate of public opinion favorable to the attainment of agency objectives. What is more, in an era of mandated public participation in resource management decision-making, environmental communication is seen as an intimate and essential aspect of generating the "feed-back" that can at least conform to legislative prescriptions if not actually contribute to agency policy formulation.

Much the same viewpoint of environmental communication is held by environmental communicators associated with citizen environmental-action organizations, except that here there is an even more frank employment of environmental communication to propound, persuade, and proselyte.

Environmental communicators in the direct or indirect employ of resource industries or resource exploiters share all of the characteristics of the environmental-action personnel, except that of course their delineation of environmental issues and options will usually be quite different from that of public ombudsmen.

Environmental communicators in institutions of higher education tend to represent two distinct species. Campus scientists turned communicators view themselves essentially as researchers whose mission it is to assure for science two key ingredients--funds and freedom, so that they and their colleagues can proceed with their investigations. Theirs is not normally the mission of encouraging the public actually to participate in environmental policy formulation. The campus communicator with a scientific tilt, on the other hand, has a more evangelical approach; he or she actively encourages a public which has Stapp's "knowledge, skills, attitudes, motivations and commitment to work toward solutions of current environmental problems and the prevention of new ones" (181).

Environmental communicators in less formal educational institutions such as nature centers traditionally adopt the rather mystic Tilden (187) approach to "interpretation," wherein what is to be imparted is more process than cognition.

In drawing distinctions among three sub-species of environmental education, Lucas (95) offers another perspective helpful to an understanding of the sub-species of environmental communication: first, communication about the environment, a form practiced, with greater or lesser degrees of sobriety, by all environmental communicators; second, communication in the environment, the peculiar province of "interpreters" in park and forest settings and in nature centers; and third, communication for the environment, or for a particular aspect or approach to environmental management, a form emphasized by communicators in resource agencies and industries and in environmental-action organizations. The media amplify messages about and for the environment. Environmental communicators associated with institutions of higher education may initiate messages about, in, and for the environment. All these distinctions may be more apparent than real, but they cannot be ignored (152).

Between the principal types or forms of environmental communication there are sufficient sub-species and intergrades to render the picture a complex one, indeed. But not so complex as to be unmanageable if we continually are aware of the distinctions between what Stamm (179) has called environmental communication as "alchemy," attempting to transform the public conscience, and environmental communication as "understanding," promoting shared perceptions.

Environmental communication research can help illuminate the processes attendant to each environmental communication purpose, provided the particular purpose is recognized for what it is. Research likewise can help clarify the content of environmental communication, provided the environmental label is not allowed to assume the proportions of what Witt (199) has called "a mystique." Any attempt totally to isolate environmental communication from the mainstream of general mass and interpersonal communication is not only a most unecological approach; it could actually retard study and practice.

Given these caveats, it has yet been found to be useful to examine environmental communication as a distinctive phenomenon (64). Upon so doing, the tenets of ecology enter the lexicon of communication.

ECOLOGY: THE LANGUAGE OF ENVIRONMENTAL COMMUNICATION

What are the cognitive concepts embodied in the use of the term environmental communication, particularly in counterdistinction to the antecedent conservation communication? The key tenets were distilled by a panel of ecologists in the maiden issue (146) of The Journal of Environmental Education (founded in September 1969 by the author):

In locus, the fouled, clogged arteries of the city quite as much as scarred countryside.

In scope, a comprehensive, interrelated humankind-environment-technology system.

In focus, global environmental impacts of crisis proportions threatening the well-being of all humankind on an over-crowded planet.

In content, tough ecological choices, not easy unilateral fixes.

In strategy, long-range impact analyses and rational planning.

In tactics, grass-roots participation in resource policy formation--in the streets and through institutional channels.

In prospect, a necessary reliance on alternative sources of energy.

In philosophy, a commitment to less destructive technologies and less consumptive lifestyles.

In essence, a recognition of pervasive interdependencies, that everything is connected to everything else--what Perlinski (122) has called "the principal intuition of the 20th century."

It would be a mistake, of course, to assume that all of these concepts have been shared equally by all the individuals, groups, and agencies flying an environmental flag. Environmentalism has called for action in one of the three principal modes that characterize the reactions of Americans to social problems--retreat, revolt, and reform.

Allied with a wave of anti-materialism current in the late 1960's and early 1970's, environmentalism of one mode has called for a type of counter-culture. Carried to the ultimate, this retreat from modernity has led thousands of young people back to wood-heated country cabins, if not to desert communes. Allied with a wave of pro-civil rights and anti-Vietnam riots also current in the late 1960's and the early 1970's, environmentalism of another type has called for guerilla tactics against despoilers of the environment, if not an outright assault on capitalism. The "battleground tactics" recommended in a "field manual" of the day ran the gamut from petitioning and picketing to outright "perturbance of

the system" (36). More commonly, environmentalism has called for reforms on the part of existing public and private institutions, or for the creation of new and more enlightened instrumentalities in both the public and private sectors. Particularly, environmentalism has been directed toward more extensive and enlightened public participation in the formation and implementation of environmental policy, again in both the public and private sectors (168).

With respect to the new environmentalism, communication has been both cause and effect. In playing its role in the emerging symbiotic relationships among biological and social systems, communication has been introduced to and in turn has introduced the language of ecology (148).

If only because "eco" is a handy tool for newspaper headline writers (193), the term "ecology," after lying in the dictionary for over 100 years, has recently begun to flit about in everybody's vocabulary like a bat emerging suddenly from a cave into bright sunlight.

What exactly <u>is</u> ecology?

From one point of view, we can define ecology scientifically, as did its inventor, Ernst Haeckel, in 1866, as "the whole science of the relations of the organism to the environment, including, in the broad sense, all the 'conditions of existence.'" More recently, Kormondy (86) defined ecology as "the study of the interrelations of organisms and their environments." Ecology is derived from the Greek root "oikos," meaning "house." So ecology is concerned literally with "houses," or more broadly, "surroundings," as opposed to cells or organs or individual organisms themselves. Perhaps the best synonym for this sense of the term ecology is: "the science of community" (116).

If textbooks are any evidence, by the 1920's four distinct ecological sciences had emerged in the United States: oceanography, limnology, plant ecology, and animal ecology. Social ecology was not to be recognized in any formal sense until the 1960's (101), although earlier Gaus (53), a political scientist, wrote of "the elements in 'the ecology' of an institution or movement," while Cutlip and Center (31) talked about "the ecology" of the rise of the public relations profession. So while ecology was once used pretty exclusively to apply to "the structure and function of nature" (116), in more recent years the term has come to be used in connection with any structure or organization or movement; yet meaning, still, the relationships among an "organism" and its environment.

Thus we come to the more philosophical meaning of ecology. In its broadest sense ecology is a holistic way of looking at things--a viewpoint that sees not the things themselves so much as their connections with other things, with the myriad of mechanisms and processes that make up the web of life--of mice, men, and mountain laurel. In this eyeball shift from thing to process, we recognize that the human observer is an integral part of the picture, for good or ill (46). This "new ecology" has even been called "subversive"--a "resistance movement" against environmental degradation (175).

Who, then, is an ecologist? Well, obviously, a modern ecologist can be a scientist, although not all scientists are ecologists by any means, not even all those who carry "ecology cards" in botany and zoology field stations. Some "ecologists" get so concerned with bits and pieces of the landscape that they literally do not see the forest for the trees. Other professors of ecology, on the other hand, are today's leading representatives of ecological thinking and action. But so are some politicians, some patrons of the arts, some historians, and some sportspersons--all those who see that everything is connected to everything else.

We give this sense of interlocking relationships the term "ecological awareness"--an understanding that the community to which each of us belongs includes "soil, water, plants, animals--and people" (93). Then, if we have an "ecological conscience" (93) as well as ecological awareness, we know that an action is right only if it tends to protect the "health" of our holistic humankind-resource-technology system; that is, its "integrity, stability, and beauty"--and we act accordingly, motivated not alone by what may be momentarily convenient or profitable (94).

So what could be called integrated environmental management is really "applied ecology"--an "environmental" approach to "the system of interrelationships among society, economics, politics, and nature in the use and management of resources" (57).

If there are any generally accepted basic concepts inherent in integrated environmental management, they have probably never been better summarized than by Commoner (26):

1. Everything is connected to everything else; or, as John Muir said it long ago: "When we try to pick out anything by itself, we find it hitched to everything else in the universe."

2. Everything's got to go somewhere--simply a popular rephrasing of a basic physical law: matter can be changed from one form to another, but cannot be destroyed.

3. There's no such thing as a free lunch; in other words, we pay for everything we do, in some way or another, at some time or other; or, as has been said, nothing exists for whose nature some effect does not follow.

4. We can never do merely one thing; or as Hardin (68) has put it: "Systems analysis points out in the clearest way the virtual irrelevance of good intentions in determining the consequences of altering a system."

Other basic concepts undoubtedly could be formulated, but these four are at the heart of the cognitive content of environmental communication, and of the strategy and tactics of the environmental movement.

THE ECOLOGY OF THE ENVIRONMENTAL MOVEMENT

In the late fall of 1969, a half-dozen people sat around a kitchen table in Madison, Wisconsin, outlining something conceived as a national environmental teach-in. One of them, U.S. Senator Gaylord Nelson, had earlier discovered the political potency of environmentalism as Wisconsin's governor. Four were students and professors (including author Schoenfeld) eager to capitalize on current campus activism to try to help project an ecological conscience into American mores. The sixth was Arnold Serwer, managing editor of The Progressive magazine.

As a journalist with genuine environmental awareness, Serwer didn't have much company in those days. Before 1970, most "environmental" newspersons had real trouble with both the substance and style of environmentalism. With varying backgrounds in nature writing, outdoor recreation reporting, science writing, public affairs reporting, or general assignment beats, they experienced great difficulty in focusing in on a comprehensive rather than a compartmentalized approach to the people-resources-technology system--the insight that everything is connected to everything else. Looking for bona fide environmental reporting in sample issues of the New York Times and the Chicago Tribune, O'Meara (117) couldn't find much before 1970. The media as a whole largely missed the emergence of the National Environmental Policy Act in 1969 (161), by any standards a landmark piece of legislation (except in the case of the Christian Science Monitor's Bob Cahn, whose prescient reporting earned him a seat on the three-person Council on Environmental Quality authorized by the Act).

Earth Day was to change all that. An Audubon writer later reported that E-Day, 22 April, 1970, became "the largest, cleanest, most peaceful demonstration in America's history" (38). An estimated 20 million people of all ages and shades participated--"dedicating themselves to saving the planet." As sociologists Dunlap and Gale said, E-Day "overnight elevated environmental quality into the public ken as a social problem" (40). Eric Sevareid pronounced the invocation on the CBS Evening News that night: "We are now dealing with final facts... This is the big test."

Given the impetus of E-Day, Fortune magazine annointed "The Environment" as "The National Mission of the '70's." By 1971, environmental issues topped the list of daily press editorial topics (149).

What was it that produced in 1970 what Walter Mondale called at the time "a remarkable phenomenon"? After all, the conservation movement had been around for a long time--the American Forestry Association, for example, since 1875. Scientists Aldo Leopold, William Vogt, and Fairfield Osborn had written environmental field manuals so early as 1948-49. David Brower of the Sierra Club had introduced brass-knuckle environmental tactics to halt a Colorado dam in 1954. Biologist-author Rachel Carson

had sounded a tocsin in 1962, Interior Secretary Stuart Udall in 1963. In 1965 Professor Lynton Caldwell had already outlined what was to become the National Environmental Policy Act of 1969. Why E-Day 22 April 1970?

That distinguished political scientist, Gaus, once pinpointed the critical elements in "the ecology" of any institution or movement as "people, place, physical technology, social technology, wishes and ideas, catastrophe, personality" (53). If we recall such factors at work in the America of the late 1960's, it may help us understand the ecology of the environmental era:

American people--students and citizens alike--had been on a decade-long emotional trip that had left them both frustrated and pent up: multiple assassinations, civil rights confrontations, Vietnam, stagflation, crime in the streets, campus sit-ins--as F. Scott Fitzgerald once described a somewhat similar era, "all gods were dead, all wars fought, all faiths in man shaken." We were ready for a cause we could believe in. It was perhaps natural that a new conservation would supply it. Ever since we first dropped anchor off Plymouth Rock, Americans have turned periodically to natural systems for inspiration and challenge (83).

Yesterday's environmental degradation had usually been over the hill and far away--in somebody else's dust bowl, somebody else's canyon, somebody else's boundary waters canoe area, somebody else's forest. But the place of environmental degradation in the 1960's was where most people live--in the foul air, fetid water, and jammed streets of the city. Millions could smell, taste, hear, and see the problem now (60).

The physical technology of the 60's had vaulted us to the moon, and thus had given us renewed confidence in our engineering capacities, but from our new vantage point in the cosmos we looked back and were struck as never before by the fragile, finite character of Spaceship Earth. By invading one new frontier in outer space, we seemed to discover another frontier at home--a state of harmony between humankind and nature (99).

Continuing along the Gaus outline, developments in social technology played a signal role in the rise of environmentalism. The voice of the mass media had become increasingly dominated by a relatively small coterie of paperback publishers, magazine editors, and TV commentators. When these communication gatekeepers almost simultaneously seized on the pesticide-population-pollution syndrome as the big story, the message was inescapable. Beginning with Paul Ehrlich's paperback Population Bomb in 1968, on down through Arthur Godfrey's 1972 "Portable Electric Medicine TV Show," the mass media began to bring ecological awareness into America's living rooms and classrooms. By 1973 a National Environmental Policy Act had energized added press coverage of environmental impacts.

In their wishes and ideas, all the great ecological philosophers had always said that true conservation would require a profound change in American values. Few people listened. But in the 60's the youth of the country began to understand, if only because it matched a wave of anti-materialism sweeping their ranks. Perhaps nothing so accounts for E-Day as this marriage of orthodox ecological ethics and the innate

iconoclasm of the young, coupled with their commitment to the tactics of confrontation at the time (78).

There was no single, Pearl-Harbor-type catastrophe responsible for the rise of environmentalism, but there were multiple mini-catastrophes: death-dealing smog in the east, oil spills in the west, water pollution in the north, lung disease in the south--there was no place to hide any more. Once bucolic retreats, the campuses themselves had become cement monotypes (138).

No single personality dominated the ecology of environmentalism as T.R. and F.D.R. had put their stamps on earlier waves of conservation. The new conservation was marked, instead, by a diversity of vigorous exponents. Few of the troops knew who their generals were, or even their sergeants. Indeed, it was a pattern of mass participation that was the peculiar personality of the era.

Out of the changing people, places, technology, aspirations, fears, and personages of America at the turn of the decade came a new spirit and a new agenda. The spirit was an embryo ecological conscience. The agenda was an attempt to give that conscience substance and application.

Of course what we have just outlined is an orthodox explanation of environmentalism and its Earth Day apogee. New Left writers in Ramparts and similar journals thought at the time that the environmental movement was invented by Ford-Rockefeller foundations to divert attention from "military-industrial investments in Vietnam" (5). Blacks claimed it was all "a WASP cop-out from the pursuit of social issues like poverty and civil rights" (47). Meanwhile the DAR and the John Burch Society saw it clearly as an imported Communist plot to "subvert the capitalist system" (114). After all, wasn't April 22 Lenin's birthday?

Whatever, E-Day was a classic "media event," dramatizing the role of environmental communication.

THE GENEALOGY OF ENVIRONMENTAL COMMUNICATION

Although we might be inclined to think so, environmental communication actually did not spring to full flower overnight on Earth-Day, 22 April 1970. Communication had been the handmaiden of the antecedent conservation movement. For striking examples of the role of communication in conservation, look at the careers of every one of the leaders recorded in Professor Douglas Strong's book, The Conservationists (182):

Henry Thoreau was a sometime pencil-maker and quasi-hermit who found his calling as a great writer. Frederick Law Olmstead, pioneer landscape architect, early turned to writing to promote his city planning concepts. George Perkins Marsh, the epitome of the Renaissance man--lawyer, farmer, manufacturer, congressman, diplomat--is best known today as a landmark author. John Wesley Powell personally publicized his classic explorations in newspaper articles and books. John Muir might have whittled away his days as the "tramp" he said he was if he had not entered into a remarkable alliance with a leading magazine editor of the day. Stephen Mather came to his National Park Service from a background as newspaper reporter and soap salesman (49). Aldo Leopold was early on the secretary of the Albuquerque, New Mexico, Chamber of Commerce and the writer of innumerable pamphlets. FDR turned to novel radio chats to sell his CCC, SCS, and TVA. Stewart Udall's pen helped his fellow Americans discover the "quiet crisis."

Gifford Pinchot may have been the premier communicator of them all. Author Strong calls him "a shrewd manipulator of public opinion...Through a stream of press releases and speeches, and by active lobbying in Congress, he carried his crusade for 'practical forestry' before the American people." Goodman-Levin, a particular student of Pinchot as a PR man, says the devices his team used were "as sophisticated as any could have been without the availability of broadcast media": publications, newspaper publicity, periodicals, teacher education, field manuals, correspondence, organizing of outside groups, and, of course, the staging of such events as the celebrated 1908 White House Conference on Conservation (59).

But Dr. Strong, in his assessment of leading conservationists, may have been swayed by the captivating personalities he was portraying. What of historians and social commentators viewing more dispassionately the "development of environmental concern", which is the sub-title of a recent collection of seminal essays assembled by Pursell? (127) How do those observers view the role of communication vis a vis what today is environmentalism?

Roderick Nash credits Robert Underwood Johnson, associate editor of Century, with conceiving and managing the campaign to create Yosemite National Park in 1890. James Leonard Bates credits a "remarkable and versatile" author, W J McGee, with scripting the White House Conference

on Conservation in 1908. Samuel P. Hays credits nationwide pressure groups as "the most effective technique adopted by resource users to influence resource decisions," post 1912. Donald C. Swain credits Herbert Hoover in the 1920's as he "crusaded from his cabinet office in Washington for conservation causes." Leo Marx credits "the mass media" with beginning "to spread the alarm toward the end of the 1960's," although he points out that America's traditional pastoral literature had previously represented "a serious criticism, explicit or implied, of the established social order" and its environmental degradation. Norman J. Faramelli agrees that "during 1970 the ecological crisis was brought before the American public via television, magazines, newspapers, and other media." Editor Pursell points out that in that year three national magazines of varied persuasions devoted special issues to the problem, each of which was turned into a book--the magazines Ramparts, The Progressive, and Fortune.

Now let us look a little more systematically at the antecedents of today's environmental communication, for if we are really to understand the genre, we must appreciate its genealogy.

Nature Writing

While nature writing can be traced back at least to the Psalms, in its modern form American nature writing has taken its inspiration from the Lake Poets of England in the 17 and 18 hundreds, and especially from William Wordsworth. Perhaps in his "Lines Composed Above Tintern Abbey" he captured most succinctly the characteristics of nature writing: fascination with nature's vast, pulsing harmony, in and of itself and as a charmed, magic casement opening on universal truth as revealed through nature.

Few products of high school literature courses are unfamiliar with at least some works of distinguished early American nature writers, 1830-1920, for example, William Cullen Bryant, Thornton W. Burgess, John Burroughs, Ralph Waldo Emerson, David Grayson, John Muir, Henry David Thoreau, Walt Whitman. Their more modern counterparts, while retaining a sense of awe, have informed their writings with a more sophisticated ecological understanding: Ansel Adams, Hal Borland, Rachel Carson, August Derleth, Loren Eiseley, Joseph Wood Krutch, Aldo Leopold, Sigurd Olson, Donald Culrose Peatty, Edwin Way Teale, and many others. For readers, if not for writers themselves, nature writing has also represented an escape from urban degradation, a nostalgia for the seemingly simple bucolic joys of a pre-industrial age. The presence of nature writing--and nature photography--continues measurable today. The magazines National Wildlife and Audubon, for example, are devoted pretty exclusively to the genre, as are TV documentaries. McEvoy (99) has used a case study of the evolution of the nature magazine (136) to document the rise of "the American concern for the environment."

Outdoor Recreation and Travel Writing

While closely related to nature writing, outdoor recreation and travel writing have distinctive lineage and characteristics.

Writing under the pen-name Frank Forester, William Henry Herbert brought outdoor writing to America in the late 1830's. Appealing to devotees of hunting and fishing, he outlined the basics of sporting etiquette and lamented the commercial destruction of wildlife and habitat. With the appearance of national periodicals like American Sportsman (1861), Forest and Stream (1873), and American Angler (1881), such outdoor writers as George Bird Grinnell and Emerson Hough not only delineated the good life of the "sportsman" but played an active role in early movements to conserve wildlife, forests, and parks. Today the genre is represented by the outdoor writer on the sports pages of practically every daily newspaper, and by the "big three" outdoor magazines, Field and Stream, Sports Afield, and Outdoor Life. Other writers and other media specialize in other forms of outdoor recreation, from golf to backpacking.

It was travel writers who lured our ancestors to America. Beginning at least with Michel Guillaume St. Jean de Crevecoeur in 1782, educated visitors from Europe sent back ecstatic essays about the New World. In the 1830's, as large numbers of Americans themselves began to explore their own country either for recreation or for homesteading, travel writing flourished. Typically one part nature writing, one part tour guide, and one part hard sell, travel writing was the plow that broke the plains, projected us to the Pacific, and laid the groundwork for early conservation successes; for example, the dispatches of a young Army lieutenant that finally lent credibilty to stories about the wonders of Yellowstone. Today, of course, travel writing continues to be big business, and in the case of National Geographic, at least, it frequently has an ecological caste, as do NG's TV specials. Reiger (129) has recently pieced together the interplay of outdoor writers and the origins of environmentalism. Huth (77) is the standard reference on the role of travel writers in introducing Americans to their first awareness of their country's ecology.

Science Writing

Ben Franklin may well have been the first American science writer. His story of his "Electric Kite" was duly recorded in his Pennsylvania Gazette in 1752. Scientific American first appeared in 1845, Science Magazine in 1883, the American Chemical Society News Service in 1919. In 1921 David Dietz became a newspaper science writer for Scripps Howard, Watson Davis' column "What's New in Science" previewed in the Washington Herald, and Science Service sent out its first news syndicate weekly release. In 1923 Alva Johnson won a Pulitzer Prize for reporting the final acceptance of Darwin's theory of evolution by the science community. The 1887 creation of agricultural experiment stations at landgrant universities had stimulated the development of "technology transfer" specialists in agriculture via multiplying farm journals, and the emergence of medicine as a science rather than a barber-pole art produced a whole range of health writers. By 1934 the National Association of Science Writers had "officialized" the genre. In 1945 William L. Laurence won a Pulitzer for his sensitive reporting of the first atomic blast (183). Scientists particularly concerned about nuclear proliferation organized a Scientists' Institute for Public Information in the late 1940's. In 1958 the SIPI fostered a Committee for Environmental Information which

now has its own journal, Environment. Environmental engineers communicate through Environmental Science and Technology. Some science writers today have become environmental or energy specialists in newspapers or on TV. Despite progress, commentators sometimes say media coverage of the environmental sciences "falls far short of what could be considered adequate, considering the critical importance of an informed electorate on matters of significance to modern civilization" (91).

Public Affairs Reporting

Public affairs reporting, of course, is as old as journalism, but at the turn of this century in America it took on striking proportions. Print technology and urbanization combined to produce the first truly national newspapers and magazines with massive circuluations, and their growing freedom from political patronage opened their columns to a cadre of scintillating investigative reporters, whom Teddy Roosevelt in a moment of pique labeled "the muckrakers" (121). Ida Tarbell on Standard Oil, Upton Sinclair on the meat packing "jungle," Lincoln Steffens on "the shame of the cities"--these and many others brought great visibility to brass-knuckles journalism and environmental issues. Robert Underwood Johnson of Century magazine particularly lent muckraking a classic environmental flavor with his stories and editorials exposing the rape of forest and parklands (109). From that day to this, solid public affairs reporting has accompanied if not inspired every conservation crusade, from the long fight over the Tennessee Valley's Muscle Shoals to today's debates over a national energy policy.

Persuasion

Persuasion, too, has a long history in America, dating at least from Thomas Paine's times that tried men's souls. But again it was at the turn of the century that persuasion and conservation made history in the person of Gifford Pinchot, as we have seen. A more modern counterpart has been David Brower, who in 1954 put together a remarkable consortium of conservation groups whose collective voice actually caused Congress to halt a Colorado dam that would have inundated Dinosaur National Monument (111). Brower's use of economic statistics quite as much as esthetic sentiments set the tone for much of the rhetoric of the environmental decade beginning 15 years later. For environmental persuaders of varied stripes, Grunig has recently put together a fairly exhaustive "review of research on environmental public relations" (62).

Environmental Communication Emergence

When did nature writing, outdoor writing, science writing, public affairs reporting, and persuasion merge into environmental communication?

Each root produced a flower stalk in the 1960's. Wallace Stegner's 1960 "The Wilderness Idea," a lyrical essay on America's last strands of naturalness and solitude, was one of [illegible] nature writings that helped generate support for the passage of the Wilderness Act in 1964. While Aldo Leopold's Sand County Almanac had appeared originally in 1949, it was not until a 1966 paperback edition received wide circulation that his "noble elegy for the American earth and a plea for a new land ethic"

vaulted classic outdoor writing into the ken of millions (155). In 1962 another rather small paperback hit the bookstands of America with the impact of a blockbuster, authored by a former U.S. Fish and Wildlife Service editor-biologist. Quietly and calmly this premier example of science writing questioned the massive use of chemical pesticides. Rachel Carson's Silent Spring "probably did more to alert the American people to the critical needs of their environment and their own health than any form of journalism before or since" (188). The Rienows' Moment in the Sun in 1967 represented the searchlight of a team of public affairs reporters turned on the intrinsic beauty and the creeping degradation of the organism called America. Stewart Udall's The Quiet Crisis in 1963 was in the great tradition of the American politician turned persuader for "an ever-widening concept and higher ideal of conservation" (141). The 1969 National Environmental Policy Act, requiring environmental impact assessments on all major federally funded projects, created a new "hook" on which to hang environmental reporting, and increased the quantity and quality of newspaper coverage of the environmental beat. The year 1969 also saw the emergence of a dozen specialized publications as custom carriers of environmental communications. At latest count there are now 93 (102). Colleagues at the University of Wisconsin-Madison have recently compiled an annotated bibliography of the environmental press open to freelance writers (154).

Irrespective of their roots, are there any common denominators among the various forms of environmental communication? Yes. All are focused on a comprehensive rather than a compartmentalized approach to the people-resources-technology system. A basic theme in environmental communication hence is interdependence--that everything is connected to everything else. This is "the principal intuition of the 20th century", as we have said.

THE ENVIRONMENTAL COMMUNICATION ECOSYSTEM TODAY

If it is true, as Pinchot (124) said a generation ago, that "nothing permanent can be accomplished in this country unless it is backed by sound public sentiment," and if it is true that public sentiment rests in part on information flow, what is the scope of environmental communication today? Environmental communicators are found in the media, in government agencies, in societies and organizations, in resource industries, in universities, and in instrumentalities of informal education.

The Mass Media

In some fashion some mass media of communication were the midwives of the environmental movement. With respect to magazines, devoted publications like American Forests, Audubon, National Wildlife, Field and Stream, and Sports Afield began exploring sporadically the broader dimensions of conservation as early as the 1940's (109). In the 1955-1965 decade, major magazine articles on conservation issues increased nearly sixfold, typified by Saturday Review's 1965 issue on "The Crisis in Water." Not in their wildest dreams, however, did pioneer environmentalists anticipate that all the big general-circulation magazines would ever devote virtually simultaneous whole issues to ecology. Yet that is exactly what happened in the five months of late 1969 and early 1970. Triggered by Earth Day, Time, Life, Newsweek, Look, Fortune, Saturday Review again, Sports Illustrated, Esquire, National Geographic, and others joined the bandwagon (149).

These printed messages were orchestrated by famous electronic voices like those of David Brinkley, Walter Cronkite, Hugh Downs, and Ed Newman. By 1972 Arthur Godfrey's "Portable Electric Medicine Show" had probably reached the ultimate in translating ecology into the language of TV. The film makers were not to be outdone. Starting in 1969, new movies, strips, and slides began to flash the environmental message on all manner of screens. It may or may not be significant that in 1979 Stephen Kellert found that among his cross-section of American adults, "watched 'Wild Kingdom' on TV" was a pastime engaged in by a full 78 percent of the respondents. Marlon Perkins' scripts are usually adeptly ecological in their messages (82).

Environmental paperbacks were exploding, too. The forerunners had been Leopold's Sand County Almanac in 1949, Carson's Silent Spring in 1962, Udall's Quiet Crisis in 1963, the Rienow's Moment in the Sun in 1967, and Ehrlich's Population Bomb in 1968. Again Earth Day blew up a veritable wave of titles, cresting in a Ballantine/Friends of the Earth series with such best-sellers as The Environmental Handbook and Earth Tool Kit.

In a nutshell, from the perspective of history there have been few more dramatic examples of the response of a free mass media to a public issue than the irruption in environmental news in the 1965-72 era. At

its best, environmental reporting has set new journalistic standards in scope and intensity. At its worst, it has merely revealed those perennial shortcomings in personnel education and perspective that haunt any enterprise with something less than a total devotion to staff training, merit pay, and the public's right to know all facets of an issue (135).

Perhaps nothing has so changed the face of environmental coverage in the mass media as has the requirement of the National Environmental Policy Act for the development of environmental impact statements on federally-funded projects, accompanied by related requirements in many states. The "102" statements have automatically provided two basic "news" ingredients--they are events that are happening now, and they have a high component of conflict. So they have become grist for the media mills. When they have prompted court suits and counter-suits, they have doubled and quadrupled both the quantity and the quality of media coverage.

Before NEPA, the environmental reporter was like a sports writer restricted largely to "think pieces" because there were very few "games" actually to cover. With NEPA, the environmental reporter has a vastly escalated number of points of entry to his running story on environmental issues and actions. It is unlikely that any other single Federal act has had such an inadvertent yet nonetheless profound impact on the flow of news on a particular aspect of public affairs.

Within the organizational framework of the media themselves, NEPA has had a related impact. Whereas yesterday the conservation/environment story was largely the domain of agricultural, outdoor, science, or urban specialists, depending upon the slant, today the environmental story is popping up on everybody's beat. Capitol, court, courthouse, city hall, education, business, women's pages, finance, health--you name it, and almost any beat is apt to surface a story with an environmental aspect. As a result every reporter has had to become conversant with issues and options. In the meantime we have also seen emerge on the larger dailies, magazines, and networks a sophisticated environmental specialist who makes no attempt to cover the breaking news of the day, whatever its source, but who concentrates rather on in-depth interpretive or investigative reporting. Recent research suggests this new breed of environmental reporters share no common background nor even a common definition of what constitutes environmental news. Whatever their training and whatever their perceptions, they do share a professional commitment to try to elucidate the economic, ecological, esthetic, and engineering aspects of the complicated subject they are covering (61, 142).

Government Agencies

All three branches of government at all levels, in addition to their regular functions, engage in environmental communication. Understandably, the resource management agencies of the executive branch are the most directly concerned (145).

Federal, state, regional, and local bureaus of conservation, environmental protection, and land management traditionally have recognized what they typically call the information-and-education (I&E)

function, and today are giving it renewed emphasis, not only to explain regularly to the public how they are spending public funds but also to set before the public an agenda for environmental action. To foster or keep pace with the environmental movement, the resource management agencies have broadened their communication efforts in both scope and depth. Whereas yesterday their public messages were aimed primarily at boosting the particular roles of the various bureaus, today there is a growing acceptance of the special interdependency of all conservation problems and programs, and a recognition of the compelling need for broad public understanding of that interdependency.

The U.S. Department of Interior literally coined the freighted phrase, "the quest for environmental quality," as the theme of its revolutionary annual reports in the 1963-68 era. The trend caught on. Some examples:

An annual report of the Eastern Region of the U.S. Forest Service does not extoll the Service or even ring the changes on the multiple-use concept; its message is clearly that "the future of modern man lies in our reconciliation with natural systems." The National Park Service in the Freeman Tilden tradition has always emphasized the role of the ranger naturalist and has now invested in NEED, NEEL, and NESA environmental education programs that are making the National Park System one big open campus (44). The Bureau of Land Management has issued an environmental study guide, "All Around You." The Environmental Protection Agency's first mass-distribution brochure was headlined "Toward a New Environmental Ethic." And even the U.S. Army Corps of Engineers is engaged in a remarkable communication campaign aimed at involving the public actively in river basin planning. The acme in the conservation/communication alliance was probably reached when an environmental newspaper reporter was named to the three-man Council on Environmental Quality and drafted its landmark report to the nation in 1970. Accelerating the upsurge in environmental communication has been the arrival on the scene of community and county conservation commissions, particularly in New England and New York.

With respect to the legislative branch of government, Congressional speeches and Congressional hearings, duly recorded in the Congressional Record, often constitute environmental communication of the most primary kind. The official coverage of the emergence of the National Environmental Policy Act of 1969, for example, became a primer of the environmental movement, and the full report of hearings before Congressman John Brademas on the Environmental Education Act of 1970 was edited and published under the title, The Environmental Problem (119). Appropriate proceedings of the various state legislatures likewise can enter the literature of environmentalism.

Decisions by various courts add to public knowledge about environmental issues. In a classic case in the author's home state of Wisconsin, for example, the State Supreme Court held a score years ago that wild river scenery was a resource quite as much as were water, trees, and iron ore; that the scenery belonged to the public and was to be husbanded for the public by the state Conservation Department; and that you didn't have to own riparian property in order to bring suit against anybody

degrading a wild river. That decision has been quoted frequently by environmentalists ever since, as you can imagine. Since 1970, as federal courts have interpreted the National Environmental Policy Act, their decisions have expanded the public's concept of environmental quality and the impacts upon it.

Societies and Organizations

Communication is the life-blood of the many and varied professional societies and voluntary associations that in turn are the life-blood of the environmental movement. Without public awareness, interest, and support, eco-action organizations could not exist, much less carry on effective programs. So communicators play leading roles in, and frequently direct, America's environmental groups (156). In the environmental age their message has been changing in two striking regards. First, it has spawned a whole array of specialized journals; and second, it has taken a broader context.

Environment, Rodale's Environmental Action Bulletin, Environmental Action, Earth Times/Clear Creek, Environment Monthly, Ecology Today, ZPG, Environmental Quality, Environmental Science and Technology, Earth-Watch, Not Man Apart--these and similar publications sprang into being as custom carriers of the eco-action message. While some were entrepreneurial journals, most of them were the house organs of various types of environmental action organizations or information centers. Perhaps nothing so typifies the irruption in environmental communications as this battery of magazines and newsletters that simply did not exist before 1968.

The organizational voice is qualitatively as well as quantitatively different today. Witness these words from the National Wildlife Federation: "Conservation is no longer just the story of vanishing wildlife and vanishing wilderness areas. There is a new urgency in the word today. Suddenly, as we stop and look at our total environment, it has taken on the meaning of human survival" (203). This is the essence of the environmental message. It is to be found not only in the newer publications but in the magazines and press releases of the traditional conservation organizations, as well as in the striking brochures of organizations like the League of Women Voters and the AFL/CIO which have joined the environmental army as untrained but willing recruits.

"The further we go, the more we realize the complicity of all things within the environmental scheme," said Ira R. Ritter, who founded Environmental Quality on a wing and a prayer and saw it grow into a momentary magazine-stand favorite. "We have had to amend our editorial objectives to include prison reform, free clinics, daycare child centers, mood music, invasion of privacy, wine and health, homosexuality, corporate priorities, and a new kind of automotive road test. But EQ will continue within 'classic' ecology to aim at the paper industry, the politics of power plants, ecotactics, environmental studies, vanishing lands and species, population control, trash mashing, and organic cemeteries." All told, Ritter said, his story was the story of solutions and workable alternatives--"guides on citizen and consumer action, household industry, economic living, and personal ecology" (130). This is the world of the

environmental message today, expressed via many associations in the absence of Ritter's specialized journal which died for lack of adequate financing.

The Resource Industries

The resource industries have been in the conservation communication game for a long time via all manner of institutional advertisements, films, and manuals. While many of their messages admittedly were self-serving, the fact that Smoky Bear and contour plowing have been the universal symbols of conservation is testimony to the effectiveness of the campaigns of lumber companies and farm implement manufacturers. Yet the population-pollution-pesticide era caught industry off base. William Houseman devoted an issue of Environment Monthly to "the pitiful environmental showing of the public relations profession." In too many cases the response of business was what Lowell Klessig has called "successive levels of lying":

"1) There is no problem, 2) there is a problem but it's not really bad, 3) there is a problem and it may get bad, but we're not chiefly responsible, 4) there is a problem and it's pretty bad and we're at least partly to blame but we're working on it, 5) there is a problem and it's bad and we're to blame and we're working on it but there is not an economical/technological solution, 6) there is a problem and it's bad and it's our fault and we're working on it and there is no technological/economical solution, and if you don't get off our backs we'll close the plant and lay off 500 employeees, 7) we don't pollute, we don't believe in pollution, we never did pollute, and we are taking this opportunity to announce the installation of a $4 million system that will be 95 percent effective in reducing pollution" (84).

There is some evidence that enlightened industry could recapture some leadership in environmental communication. Without exception the two best ecological primers in early circulation were products of business PR: Kaiser Aluminum's magnificently scripted and illustrated brochure on "Ecology, the Man-Made Planet," by Don Fabun, and Bank of America's very solid environmental handbook, "Getting Down to Earth." Along another tack, Gulf Reston, Inc., won a national award for its community Nature Center near Washington, D.C., the Hilton Head Company was similarly recognized for its environmental arts center in South Carolina, F. Eugene Smith Associates earned plaudits for its touring "Ugliness Show," and the Advance Floor Machine Company was cited for its "Let's Keep It Clean" films, billboards, window stickers, lapel buttons, litter bags, posters, and radio-TV spots.

As American business and industry learn to make as much money out of restoring the environment as they have out of degrading it, the environmental communication voice of the private sector can be expected to come through increasingly loud and clear. A recent study of oil and forest industry corporate image advertising, for example, suggests that, far from contaminating the essential concepts of environmental education, the oil and forest industries have in fact been captured by the environmental movement, at least as measured by their messages in national magazines (6).

Although Petulla (123) contends that "the wealth of the corporate world contributes to the manipulation of the mass media" in an anti-environmental backlash, and that many large firms believe that "by sheer weight of money and words they can build a credibility that their actions don't warrant," Petulla at the same time admits "it is astounding that in the face of such economic power so much environmental activity should exist at all." He cites the case of the Pacific Legal Foundation, a California environmental defense fund, which has "prevailed in 80% of the cases that reached final judgment." The phenomenon, says Petulla, "tends to support the belief that the germination of a healthy environmental ethic is ultimately possible."

In the presence of relatively objective environmental specialists in the media, it is increasingly difficult today for either side of an environmental issue to dominate news columns or air time. Environmentalists, being a relatively impecunious lot, have had to expend their limited resources largely on rifle-type communications to selected public-opinion moders. Business and industry, on the other hand, have no such fiscal problems. The result is a continuing employment of shotgun institutional advertising in newspapers and magazines and on television (176). Some of this advertising is relatively soft-sell; some has all the finesse of a meataxe. Whether any of it changes any hearts or minds we have no Nielsen ratings to indicate.

In the final battle of Armageddon between economics and ecology, organized labor may well hold the ultimate weapon. If the AFL-CIO and its sister unions were to negotiate for a sanative environment as well as for wage and job security, the shot could well be heard around the world. To date, the rhetorical posture of the AFL-CIO headquarters is impeccable. Leading labor men and their money have played key roles in environmental education. At the local level, however, the story is something else again, with unions fronting for urban sprawl and opposing bottle bills, for example. So long as the most endangered species in America is the Detroit auto worker, labor's position on environmental issues will be as excruciating to develop as it is pivotal to any kind of social and scientific entente on environmental affairs. More than in laboratories or legislatures, the next chapter in environmental communication may be written in union halls.

Institutions of Higher Education

Professors and students helped shape the environmental movement, and now environmentalism is re-shaping the university (162). The history of higher education may offer no more telling example of the interplay of life and learning in America. Invariably the early-warning-radar voices of environmentalism were those of university professors. As Aldo Leopold once wrote, ecologists live in a world of wounds, and in the early 1960's they began to cry out in force, and not just card-carrying ecologists either. What these university professors didn't have in common was a discipline; they represented a range of sciences, social studies, letters, and professions. Yet they invariably shared one characteristic: they were relatively senior, tenured faculty, secure in the campus power structure, and hence free to wander outside their specialties, engage in some holistic thinking, and coalesce around

what Shepard called "the subversive science" of a new human ecology which began to call into question whether old-fashioned "progress" was in fact our most important product (175).

Given cognitive substance by professors, the environmental movement drew its affective processes from university students. Honed to a knife edge by free-speech confrontations, civil-rights marches, and anti-war riots, campus youths of many stripes seized on "ecology" as the newest manifestation of the basic anti-materialism that was their hallmark in the mid-1960's, climaxing in that nationwide campus teach-in on "Earth Day," 22 April 1970.

Barring English composition and math, few university subjects are being offered today in so many diverse ways and places, by such a mixture of colleges, departments, and faculty, as that complex of ecology, economics, energy, engineering, esthetics, and ethics known, precisely or not, as environmental studies. No self-respecting campus is now without some gesture toward environmentalism, and the more substantial enterprises represent a major departure in university focus and format toward multidisciplinary, multi-function, problem-oriented teaching, research, and outreach. What is more, the impact of an environmental influence has actually changed the administration and management of the university, and may even yet change the common life within the university (87).

It is striking the depth to which environmental studies concepts have penetrated the academic structure--wholly new instructional curricula and organizational arrangements at the undergraduate level, wholly new master's degree programs, wholly new cross-discipline Ph.D. research arrangements, wholly new extension configurations. While in some cases the changes may prove to be more semantic than surgical, there is little doubt the impact of environmental studies will long be in evidence on the broad physiognomy of the campus (167).

All elements of the genus environmental studies are conscious, to greater or lesser degree, of an outreach, adult education, or public service mission, however defined. The outreach dimension has recently received a big shot in the arm from the formation of the federal Department of Energy's National Energy Extension Service, fully funded in April 1979. Ten pilot programs are already in being. One such, for example, includes in-home consultation on conservation techniques in a low-income neighborhood, workshops on the safety and efficiency of woodburning stoves, research and education in fuel economy for haulers of farm products, insulation advice for the tourism industry, workshops for local government officials, instruction for professionals like architects who influence energy consumption, an information service for the mass media, a demonstration solar house, and an experimental alcohol-powered auto.

Environmental studies programs in far-away places with strange-sounding names may mask the real curricular impact of the environmental movement on American colleges and universities next door--the subtle influence of environmentalism on the warp and woof of traditional schools and colleges within a university, breaking down barriers among conventional disciplines to produce cross-discipline undergraduate

classes and graduate research seminars. While some of that influence may have resulted only in cosmetic changes in course descriptions and college catalogs, the evidence suggests a reasonably profound and relatively rapid adjustment of substantive offerings to the impulses of the environmental decade. To be specific, at one representative university, course titles with an environmental tilt have risen in number by 443% between 1966 and 1976, not even counting the obscure changes in the contents of courses sans changes in titles.

Unquestionably, then, environmental studies have had a measurable impact on the campus. For undergraduates they have offered an air of relevance to the higher learning. For graduate and professional students, they have provided entres to new careers in both the public and private sectors. For faculty, environmental studies at their best have broken down the ivy curtains that had tended to shroud each discipline and its approach to researchable issues. For administrators, environmental studies have provided a nudge to rethink campus configurations, explore new outreach activities, and practice energy conservation.

The role of the university in the energy crisis--both as a research institution and as a catalyst for change in architecture, community planning, and conservation techniques--may be crucial to a national energy policy. In turn, the demands of energy conservation will have a profound impact on the university. An Energy Task Force sponsored by the American Council on Education has already developed an energy management field manual as a guide to how the campus can play the role of good citizen--and save money.

Whatever the level of enterprise, President Robert C. Good of Denison University believes professors and students of environmental studies need certain skills: skill in the analysis of complex interactive systems, long-term effects, linkages of factors, and the worldwide consequences of local decisions and actions; skill in the his torical analysis of the human perceptions, attitudes, and idealogies that can complicate the application of scientific knowledge to the solution of environmental problems in differing economic and political systems and in differing cultures; skill in the analysis of values and in rendering moral judgments; in recognizing, for example, that growth and progress are not necessarily synonymous; and skill in personal involvement in problem- and policy-oriented interdisciplinary action befitting a literate citizen of a beleaguered planet (58).

It has been said it is easier to move a cemetery than to move a university faculty, and it has also been said, of course, the campus is an ivy tower with no measurable impact on the outside world. The university-environmental movement marriage gives the lie to both statements. For having exchanged those vows in 1968-1978, neither higher education nor the country will ever be the same again.

Other Educational Instrumentalities

In some ways, even more striking than the university-environmental movement marriage has been the proliferation of educational materials to support environmental instruction in the elementary and secondary

schools. Prior to 1968 the subject of conservation was largely confined to the last chapter of the ninth-grade science text. Today the problem of the alert classroom teacher is one of digging out from under a deluge of exciting new study guides, field manuals, and film strips, and not-so-exciting administrative rhetoric.

The less formal educational institutions--such as libraries, museums, youth organizations, civic groups, and so on--are likewise the sites of stepped-up environmental communication. Indeed, the environmental movement has brought about the recrudescence of that special educational agency, the nature center. Various types of such centers are bringing a capsule view of spaceship earth to thousands of citizens around the country.

The largest and in many ways the most effective informal adult education activity in the United States is the agricultural extension service, epitomized by the "ag agent" in virtually every county seat in the country. Where once he or she was promoting pesticides, wetland drainage, sod-busting, and other deleterious farm practices, today the county agent is starting to develop lines of communication with community conservation commissions, lake protection associations, and other public and private environmental groups; and he or she is being backstopped by an increasing array of environmental communication materials eminating from the land-grant colleges.

Recent studies show that approximately three out of every five American adults engage in one or more educational programs of some type or other after completing their formal education. To serve this waiting audience with sophisticated environmental messages, new communication technology is emerging: state ETV networks, video-cassettes, and cable television, to name some of the most notable in being or on the horizon.

Even more intriguing, the possibility in the next fifteen years of the nation wired to coaxial cable with a two-way capacity promises to improve the level of public knowledge on environmental problems. The so-called Home Information Utility will permit individuals to command such computer-stored resources as a complete index of library information on any given environmental subject, with complete texts of books and articles, if desired; a listing of pending bills, hearings, and decisions; background information on a breaking news event; the ability to monitor a public meeting; consumer information; and the opportunity to register an opinion instantaneously in a local or national referendum on an environmental issue.

On the global front, a satellite-based community TV network for less-developed nations as large as India could conceivably become operational by 1981. Provided that the government of the receiving country cooperates, such a TV network would make possible direct transmission of programs from a so-called advanced nation into community receivers appropriately modified. The possibilities are challenging, to say the least, for a vastly broader environmental communication ecosystem (141).

CONSTRUCTING A SOCIAL PROBLEM: THE PRESS AND THE ENVIRONMENT

Social problems are the products of particular constructions of social reality, rather than necessarily the products of an actual physical condition (178). Some persons--variously called "moral entrepreneurs," "issue energizers," "concern innovators," or "claims-makers"--communicate their concern and the expectation of a solution to others. To the extent that collective definitions of problems come to supplant individualistic definitions, a social problem can be said to exist (8). As claims-makers are able to persuade others of the legitimacy of their concerns and are able to recruit early converts, a collective definition of a problem forms.

If claims-makers make salient for others a particular aspect of social reality, they may do so in a crude sequence. According to one model of the origin of social problems, an initial stage calls for a cohort of claims-makers to begin making claims about a putative problem or cluster of problems (178). As the claims-makers communicate to attract early converts to the proposed point of view, they are aided significantly if they can encompass their concern in a distinctive term, if only for the convenience of headline writers. Thus an examination of the evolution of a particular term can provide some clues to the recruiting activities of claims-makers in the early construction of a social problem, and to the role of the press in its delineation. The terms "environment" or "environmental" serve these purposes admirably.

In the 1960's, faced with energizing public awareness of what were early identified as "the four P's"--pollution, pesticides, population, and people's habits (13)--the early claims-makers apparently sought a compelling phrase or phrases that would signify a new, comprehensive approach to what Leopold (92) as early as 1933 had called a "conservation ethic." Steadily there emerged "environment," "environmental," "environmentalist"--each of them old, technical terms adapted to new, popular purposes. In an earlier day the comparable terms were "natural resources," "conservation," and "conservationist." Those terms at one time had reasonable operational utility and great respectability (71), but by the 1960's they were essentially shopworn at best and at worst misleading in relation to new ecological concepts.

As revealed by a reconnaissance of newspaper, periodical, and book indexes and other reference data, significant dates would seem to be these in the evolution of terminology specifically "environmental":

1959--Raymond Dasmann (35) bridges semantic eras with a text called Environmental Conservation.

1962--The earliest reference to "the environment," in the Dasmann sense of the term, in a public document, in a Natural Resources report to the President by the National Research Council (112).

1963--"Environment: A New Focus on Public Policy," a paper by Lynton Caldwell (16); the term "Environmental" first appears in Bell Telephone Directory Yellow Page listings (27); Stewart Udall's U.S. Department of Interior annual report is titled Quest for Environmental Quality.

1964--"Total Education for the Total Environment," a convention paper by Matthew J. Brennan (13).

1965--Future Environments of North America, a published proceedings (33); Restoring the Quality of the Environment, a government report (192).

1966--Faculty committees on "environmental studies" emerge in colleges and universities (167). Resources for the Future publishes Environmental Quality in a Growing Economy.

1967--Prototype bills appear in Congress providing for a high-level "environmental quality council" (48); the American Academy of Arts and Sciences devotes an issue of its journal (Daedalus) to "America's Changing Environment;" the Environmental Defense Fund founded; the American Institute of Architects sets up an "environmental education" committee.

1968--A unique joint House-Senate colloquium on a "national policy for the environment" (24); a prospectus for a Journal of Environmental Education; Barry Commoner's Scientist and Citizen journal is restyled Environment.

1969--The National Environmental Policy Act (NEPA, Public Law 91-90); the founding of Environmental Action, Inc. (113); Time introduces an "Environment" section in its 1 August issue.

1970--National Wildlife, originally dedicated to "the wise use of natural resources," becomes pledged to "improving the quality of the environment;" Fortune devotes an entire issue to "The Environment"; E-Day, 22 April, elevates "environmental quality" into the general public and daily press ken as a "social problem" (40).

As appears apparent, the early chronology of environmental terminology featured books, journal articles, agency reports, convention speeches, citizen movements, Congressional acts, specialized periodicals. It certainly seems that prior to 1969-1970 newspapers were slow to play much part in recognizing "environmentalism" (134, 171, 200).

A number of theoretical models have been constructed to describe the movement of information from one social system to another. Kaufman (81) and Kotler (88) seem to support the view that information about "change goals" is disseminated by claims-makers to the communications subsystems and thence to the public and the government. Tichenor et al. (186), on the other hand, posit that the flow is "from professional and interest group concern through independent publication and attention in government to mass media attention and public concern." At least in the case of the data presented in our environmental terminology chronology, the latter information diffusion model would seem to have been operative.

That a person's conception of social reality may indeed by influenced in part by newspersons engaged in their calling is strikingly, albeit inadvertently, suggested by sociologists themselves. Writing about American social problems, three California sociologists attribute the "sudden emergence" of "the pollution issue" to the Santa Barbara "oil slick disaster" and its "intense media coverage" as "the generating symbol of eco-activism" (96). In the Pacific Northwest, on the other hand, three sociologists trace the rise of environmental action back to mountain-climbing groups prominent in the news in that part of the country (69). Meanwhile, writing from a Michigan perspective, three other sociologists (108) use E-Day 1970 as the touchstone of environmentalism, the E-Day concept having been pioneered and extensively covered at Ann Arbor. Yet two Canadian sociologists (173), with a more global orientation, see "support for environmental improvement" as "international" in its origins.

The "real world" may tend to be, then, in part what one sees and hears via convenient communication media. The bulk of the evidence suggests that the daily press does not seem initially to have operated as effectively as other modes of communication--interpersonal, news letters, proceedings, journal articles, books--to provide early environmental claims-makers a platform and help define the core concepts of the emerging social problem. At least in the case of the construction of environmental degradation as a social problem, then, the daily press appears to have been a somewhat tardy and halting adoptor.

Why did the daily press so function? From past communication research a number of hypotheses suggest themselves. Breed (12) has described a potentially pervasive albeit subtle influence of newspaper publishers on "news policy" via a process of "social control in the newsroom." Beginning with vicious press attacks from the chemical industry on Rachel Carson and her Silent Spring in 1962, what was to become the environmental movement has been viewed by many conservatives as anti-business, even anti-American (3). To the extent they are representatives of "the system," newspaper publishers may very well have been reluctant to provide a platform for the early voices of environmentalism.

Donoghue, Tichenor, and Olien (39) explain the press' role in a social system as instrumental to conflict resolution, tension control, and community cohesion. They suggest that report of conflict in the press reaches a level potentially dysfunctional or disruptive to the social system of the community more readily in a small town than in a large city. Since tension and conflict is best handled interpersonally in the small town, the press there assumes more of a "boosterism" or cohesion-building role, eschewing reports of local conflict within the social system. In the larger, more pluralistic social system, the press serves as a liaison among conflicting subsystems, and therefore contains more conflict-related information, although the large city press must also perform some distribution control of information which would dissipate tension and reinforce social cohesion. This model may suggest the dynamics behind the results of studies conducted in predominantly rural places such as Oregon and Kansas which found evidence of environmental "Afghanistanizing"--that is, the early tendency of the press in those studies to "deal with the problems of the community 'up the road apiece'

rather than with local issues" (76). Griffin (61), in a study of daily newspaper environmental reporters, found that the reporters in small cities are much less likely than reporters in large cities, taken as a group, to consider any form of pollution coverage as at least one of their main approaches to covering environment, even though both groups agree about equally that some form of pollution is a significant problem in their newspapers' areas.

A less conspiratorial hypothesis stems from Hall's (66) three basic criteria of "news." Unlike the 1969 Santa Barbara oil spill, most environmental degradation was seldom linked with (a) an interesting, unusual, and/or significant (b) event (c) occuring in the past 24 hours. Nor prior to 1970 were there any comprehensive government agencies to help "stage" environmental events. In the absence of a continuing series of news events to be alluded to, the environment as a holistic concept was simply largely invisible to newsroom eyes until NEPA and E-Day made "news" (43).

As Hall (66) says, news is not a pure cultural product, "it is the product of a set of institutional definitions and meanings, which, in the professional shorthand, is commonly referred to as 'news values.'" It simply took time for holistic environmentalism to acquire news value in U.S. city rooms, despite the diligence--indeed, stridence--of early claims-makers. However, categories of news, consistently produced over time, tend to create space in the media (66). Once a category has come into existence as a legitimate news category, different orders of meaning and association can be made to cluster together--and produce more media space. Hence the discovery of "the environment" as a social problem in 1969-70 had an effect on "news values," perhaps an even greater effect than environmental events would justify at any one time. Indeed, Chase (21) has argued that amateur "eco-freaks" borrowed McCarthy-like tactics to generate phony E-Day crises to jolt the public, abetted by a press suddenly compliant with environmental claims-making.

The glacial emergence of environmental issues as news Galtung and Ruge (52) would explain in a related way: every event has a "frequency," a time-span needed for the event to unfold itself and acquire meaning. The less similar the frequency of the event is to the frequency of the news medium, the less likely it will be recorded as news by that news medium. By its very nature, the slow process of environmental degradation was simply not in tune with the day-by-day time-frame of the press. Prior to 1969, environmental claims-makers had to use other media of communication. Once environmental issues burst into the consciousness of the daily press, then we see what Rock (131) calls a "self-generated paradigm": the environment became news simply because newspersons said it was news, with a resulting marked climb in coverage.

Another possible explanation for the slow press recognition of holistic environmental news is what might be called the lack of "class consonance" between early environmental claims-makers and reporters-editors. Earlier analyses of "moral entrepreneurs" suggests the importance of class consonance between claims-makers and agenda-setters (65). Almost without exception the early-warning radar voices of environmentalism were those of university scholars. By the nature of their calling, such persons publish initially in scholarly journals and

form sophisticated interest-groups. By their human nature they not only are not adept at capturing press attention, they seem deliberately to avoid it to escape colleague charges of "popularizing." They do not readily fraternize with press people, or vice versa. One newspaper reporter has labeled such early environmentalists "pretty feckless--they didn't know how to stage media events." Another said "they had no imagination." A third, that they were "nothing but common scolds" (142). Early environmental claims-makers and the working press simply represented alien worlds.

By 1969-70, once adroit old-line conservation organizations and their PR personnel acquired an environmental tilt, once environmentalism became institutionalized in all manner of departments and commissions at the federal, state, regional, and municipal levels of government, and once these bureaucracies became staffed with professional and managerial types in class consonance with reporters and editors, the environment, so to speak, changed quickly and markedly. Environmental issues gained stable press salience because the issues had become professionalized--"de-scholared," and they were in the care of people who not only "spoke the same language" as reporters and editors but people who were adept at creating the interpersonal communication that leads to space in the press (67).

Another possible explanation: In its gestation period there were few if any card-carrying environmentalists in the working press. By 1969-70 they had begun to infiltrate, as it were, and began to engage in environmental reporting as "purposive behavior" (106). Some environmental writers and their editors quoted in Omohundro (118) are indeed overtly conscious that a reporter can literally "make things happen."

A fifth, and perhaps the most likely, hypothesis stems from Tuchman's (189) proposition that newspersons systematically decrease the variability of happenings that form the raw material of news, in order routinely and expeditiously to process unexpected events. One essential "routinizing" device is "the beat"--courts, city hall, education, business, farm, and so on. The problem with "the environment" was, of course, that by its very nature it could not fit neatly or consistently into any one conventional beat. As an environmental reporter has described "a classic environmental story," it was "a business-medical-scientific-economic-political-social-pollution story" (142). That "the environment" defied routinization might alone explain why the daily press was slow to seize on the complicated subject in any depth. The environment fell between the newsroom chairs until "the environment beat" emerged in 1969-70 (41).

What, then, might be the "predisposing conditions" determining the extent of daily press involvement in the early construction of a social problem? We suggest five:

First, the problem probably must be such that claims-makers can provide the press with a continuing series of "news" events befitting newsroom values.

Second, the problem probably must be indigenous to one of the established stylized "beats" routinely employed by daily newspapers.

Third, early claims-makers and editors-reporters probably must share a class consonance.

Fourth, participant-type journalists probably must infilter newsrooms rapidly.

Finally, although this point is debatable, the claims-makers and their proposed solutions perhaps cannot be viewed by publishers as representing a serious economic threat.

As we have suggested, however, it is apparently not necessary for the daily press to contribute much to early claims-making in order for a social problem to take on shape and substance. At least environmentalism would seem to have come about because certain "issue entrepreneurs" grasped an ecological imperative and were able to mobilize concern among an increasingly widening circle sans much press attention. The environmental message did not appear on the agenda of the daily press to any extent until legislative acts, staged events, and accidents (28, 48, 107) lent it salience.

Drawing heavily on Tuchman (190), let us try now to summarize the evolution of the environment as a social problem vis a vis the role of the press.

First, the news machine is a net, not a blanket. It is designed to catch big fish, allowing the minnows to slip through the interstices. In the early 1960's, positive environmental claims-makers were minnows, disassociated from the "beats"--the strands in the news machine net. That the early environmentalists actually spanned the net as a whole the press simply was not prepared to contemplate. The early environmental claims-makers were effectively masked from press attention because reporters seemingly cannot write about people hidden from press view by their social location; that is, either their topographical site or their social class.

Second, the dispersion of reporters by territory, institutionalized specialization, and topic is formalized in the format of the newspaper itself--general front page, sports, women's, financial news, and so on. Where was the early environmental claims-maker to be positioned? He or she simply didn't fit the unecological schema of the press, where nothing is connected to anything. Some environmental claims-makers found a niche in outdoor page coverage, others in science columns, a few in the growing women's page attention to consumer affairs. But by and large early environmentalists were square pegs in round press news holes, except when an Ehrlich or a Commoner rated "op-edit" space with particularly emotional claims. Such traditional press norms could have produced a disjointed cognition of the environment in the reader, so that his social reality of the environment was not compatable with that of environmental claims-makers. In other words, the neutral and event-oriented journalist, by virtue of his role definition, reinforced by the structure of the newspaper, may have an effect on the reader even if the newsperson thinks he does not.

Third, what, then, was it that finally brought the press into an holistic environmental era despite seemingly insurmountable institutional constraints? To borrow explicitly Tuchman's metaphor, news is a window on the world. Through its frame, we learn of ourselves and others. By 1969-70 the environmental imperative was so compelling in all its manifest interdependencies that the press simply had to respond. Hence the appearance of environmental reporters, environmental columns, even environmental sections. What had once been a shuttered window was, to quote Coleridge, now a "charmed, magic casement opening on the foam of perilous seas," replete with disappearing wilderness, urban congestion, air pollution, oil spills, lung disease, sick water, petrol shortages, and, on the horizon, global starvation or holocaust--all interconnected.

The American press has been praised--and accused--of being responsible for the custodianship of conventional traditions, and at the same time is charged with being responsive to changing public needs and aspirations. It could be that in its role as the reluctant dragon of environmentalism it has played out both missions with something akin to the meliorism that is the mark of the middle way--for better or worse--in American culture.

(Note: This chapter appeared, in modified form, in the October 1979 issue of Social Problems; see bibliography entry 165).

ECOLOGICAL CONSCIENCE IN THE NEWSROOM TODAY

The author husbands a country woodlot in southwestern Wisconsin. Since the woodlot hasn't been disturbed much for 40 years or so, it is given over largely to maturing black and red oaks and hickory, with here and there giant poplar and white oak vestiges of earlier eras. The understory is sparse. What would happen were lightning or a match to send a fire roaring through part of the woodlot on a dry fall day? Well, the order of what ecologists call "plant succession" is pretty predictable for that site. By the next spring you would see forbs--probably ragweed--beginning to obscure the charred duff on the woodlot floor. In a year or so blackberries would begin to invade, then sumac. In time this woody-bush stage, or "sere," would be replaced by aspen, a vigorous pioneer tree in Wisconsin. Ultimately the area would move again toward an oak-hickory "climax," assuming no other disturbance were to occur, but the evidences of the fire would persist a long while, if only in the form of scarred tree-trunks or remnant aspen and blackberries.

We cite this bit of ecological history because it may help to explain what seems to happen in any news-gathering organization. In times of relative quiessence in public affairs, a beat system develops to "routinize the unexpected," as Tuchman (189) describes it. When a major new topic or issue or movement emerges rather suddenly, there is momentary confusion as the beat system struggles to adapt. A new beat is likely to succeed. In time that beat may disappear or it may become a part of a new mosaic moving toward a new "climax" stage of organization.

The successional nature of the beat system is aptly illustrated in the response of the news media to the environmental movement in the 1965-80 period. Because environmental issues fell between existing beats, the mass media initially were slow to lend integrated coverage. By the fall of 1969, however, environmental specialists by that name had appeared in Time, in the New York Times and the Chicago Tribune, and on the CBS Evening News. By 1971 the new beat could be found across the country. It flourishes today both as a separate beat or as an aspect of many other beats, its exact nature depending on local environmental conditions and on the presence or absence of newer issues and beats, like the energy beat.

Whatever the configuration, investigating and interpreting environmental issues is an exacting and challenging arena for public affairs reporters today. The New York Times' Hill (73) says "the environmental movement is probably the most extensive and profound event to hit the world since the Industrial Revolution." Hart (70) likens the environmental "revolution" to "the European Renaissance" as "a fresh dynamic."

In the early summer of 1970, following Earth Day, 22 April, Editor & Publisher invited the press to record with E & P the names of those "writers specializing in environmental news coverage and features"--"the so-called ecology beat." The 8 August 1970 E & P carried the resulting list (41). On it were 107 individuals on 83 newspapers, 4 city magazines, 7 news syndicates, and 4 college papers. It was this list that Witt used in 1973 as the basis of an initial survey of the first recorded reporters specializing in environmental issues (200). We sought current information from the listed newspapers and their staffs (142).

Reporters Move, Beats Don't

The field of journalism generally is marked by a high level of job mobility (80). This characteristic is certainly true of the environmental reporters interviewed. Of the environmental reporters on the 69 dailies both on the 1970 E & P list and extant today, only eight of those reporters are known to be in place on the same papers and still covering the environment.

Where had the veterans come from? Witt's study found that as a rule environmental reporters had been recruited from general-assignment or government beats, with a minimum of science background. Of the eight 1970-79 veteran continuing environmental reporters, however, six did come from science-medicine-outdoor-conservation-agriculture experiences. On the other hand, reporters replacing the original environmental writers invariably have come from courts-public affairs-government assignments.

While high mobility apparently marks the environmental reporter as a person, the beat itself seems to continue to be in place on all but a few of the dailies instituting it in 1969-70.

How Do You Define the Beat?

Tuchman has described how newspersons seem to decrease the variability of happenings that form the raw material of news, in order routinely to process unexpected events (189). One device is "the beat"--courts, city hall, education, business, farm, and so on. The problem with "the environment" is, of course, that it doesn't fit neatly into any one beat. As Don Boxmeyer, St. Paul Pioneer Press, describes "a classic environmental story":

> It's a business-medical-scientific-economic-political-social-pollution story. It's been going on for years and promises to continue.

That "the environment" or "ecology" defied routinization may partially explain why the daily press was slow to seize on the topic in any depth in the 1960's, compared to paperbacks and magazines.

Newspapers in this study and their environmental writers are still having trouble defining the environmental beat. Witness these diametrically opposed views of two reporters:

> I am no longer assigned to the ecology-energy beat. For the last three months I've been working on a 15-part series on occupational health and safety.--Bruce Ingersoll, Chicago Sun-Times.
>
> Environmental news here now emphasizes the impact of carcinogen pollution on worker safety and community health.--George Dawson, (New Brunswick, NJ) Home News.

The appearance of a so-called "energy crisis" in 1973 seems to have complicated the routinization process. Was energy a part of the environmental beat or wasn't it? The jury surveyed is undecided:

Pro-Energy

> Environment and energy are so interrelated I have insisted the two should be covered together.--Stuart Diamond, Newsday.

Con-Energy

> Energy and environment are separate beats here.--Paul Hayes, Milwaukee Journal.

Because the organization of newspaper work can't rely on a random search for news, the newsperson "actively squeezes events into categories suitable for the smooth running of the media bureaucracy," as Cohen and Young once put it (23). Thus environmental news may be "manufactured" by a journalist through interpreting and selecting events to fit the pre-determined scope of his or her environmental beat.

Is the Environment "Newsy"?

While the best definition of "newsworthiness" may well be "that which a newsperson says it is," it is generally agreed that one ingredient is invariably "the non-routine." It is one of the anomalies of life, then, that while newspersons go out of their way to "routinize the unexpected," they seem to "devalue" as "news" the routines of others.

We can see this happening in the way the environmental reporters surveyed comment on the changing status of environmentalism. As it has evolved from a popular street-movement to a function of government, and as environmental agencies have sought to routinize environmental protection, "the environment has lost its zip as news," as one reporter puts it:

> The government bureaucracy has tended to take over the environmental movement, putting everybody to sleep in the process.--Harlan Draeger, Chicago Sun-Times.
>
> Agencies have been created, programs mounted, timetables set in place. All this represents progress, of course. But covering compliance schedules or delays in timetables is not of much interest to our readers. The newness--or "newsness"--has worn off. This month's environmental issue sounds a lot like one that was much more dramatic when it first appeared 3-5 years ago.--Stan Strick, Minneapolis Star.

If the media do not merely transmit messages but "structure 'reality' by selecting, emphasizing, and interpreting events," in the words of Weiss (195), the declining "newsworthiness" of environmental issues may have important implications, if the reporters in this survey were representative. Particularly, any lack of "mobilizing" information with respect to environmental problems Wiebe sees as tending to produce in the public a state of "well-informed futility for lack of a means of translating need into action" (197). O'Meara has documented a decline in environmental coverage in sample issues of the New York Times and the Chicago Tribune--from 1,259 inches in the former in 1970 to 683 in 1977, and in the latter from 1,036 inches in 1970 to 791 in 1977 (117). Such data may suggest that for environmental reportage there are limits to growth as "newsness" declines.

Newsroom Pressures at Work

Breed, in his classic paper on "social control in the newsroom," described a pervasive albeit subtle influence of newspaper publishers on "news policy" (12). Some publishers' motives may stem in part from a desire to dissipate community tensions, particularly in smaller cities--"boosterism," in other words. That such influences have been felt by some environmental reporters, there was some evidence in this survey:

> I lost my former job (on a suburban weekly) when the paper's publisher backed down in a confrontation with a big condominium developer.--Lou Wein, Fort Wayne (Ind.) Journal Gazette.

> Part of the reason for my leaving (city) was my publisher's discovery that environmental writing is not non-controversial. I had won several prizes in 1972 for coastal-protection reporting--reporting later repudiated in editorials. So be it.--(not for attribution).

Given such pressures, no wonder Dwight Jensen wrote about "the loneliness of the environmental reporter," in a 1977 Columbia Journalism Review. But, as Donoghue et al suggest (39), some publishers, particularly those of large dailies, positively seek to generate conflict, albeit again as a type of social control. That their motives may be quite personal as well is attested to by this observation:

> My paper will not abandon the environmental beat. The publisher takes an avid interest in things environmental. His interest arises from his even greater interest in fly-fishing.--Bruce Ingersoll, Chicago Sun-Times.

In general, Breed pictured the typical reporter as something of a willow tree bent by all the pressures of the newsroom to "conform." Apparently, however, a dedicated environmental reporter can exercise some "social control" of his or her own:

> I see my job partially as that of raising the ecological conscience of my colleagues. And I must say I've had some success with our wire editor particularly.-Paul MacClennan, Buffalo Evening News.

> I have long been interested in environmental issues...The environmental beat was restored after some lobbying on my part.--Susan Stranahan, Philadelphia Inquirer.

Social control, in other words, can operate in both directions in the newsrooms represented in this study.

Objectivity in Environmental Reporting?

Tichenor et al have found that, in the interests of maintaining credible relations with their scientist sources, science writers can be "co-opted" by those sources (185). Are environmental reporters being "co-opted" by the new environmental protection agencies or, for that matter, by public environmental action groups? The evidence from this survey was largely on the side of relative objectivity, if not plain jaundice:

> A lot of the new environmental aficionados do not have correct information, particularly with respect to alternate energy. --Stuart Diamond, Newsday.

> Most times (EPA) will give you solid answers to your questions--if you know what to ask.--David Greene, Greensboro (NC) Daily News.

Such reporters don't sound like they are "fronting" for any bureau or organization. Indeed, some may seem to feel they have built up a certain expertise that at least equals that of their sources.

Gladwin Hill, long-time national environmental correspondent for the New York Times, probably states the case for objectivity as well as it can be put:

> In environmental reporting a reporter is only as good as his credibility, and his credibility is only as good as his objectivity. For instance, I've been blasted far more vehemently by federal environmental offices for stories I've written that were inferentially critical than by anyone in industry for stories of the same sort. Conversely, I have numerous letters of praise from both conservationists and industry people for the impartiality of controversial stories.

"Crusading" Environmental Reporters

That they do not seem to have been "captured" by their sources does not mean that the environmental reporters represented in this study were not without a sense of mission. But their "client" is not a government bureau or a club; it is the environment itself.

Cohen (22) and others (80) have found a clear dichotomy between "neutral" journalists and "participant" journalists, the former pledged to a "nothing but the truth" presentation of "verified" news that does not reflect the personal values of the newswriter, the latter to a "whole truth" approach in which the newswriter intrudes to seek out all

angles, objective or subjective, so that all "relevant" information or opinion is presented. Most of the environmental reporters surveyed clearly saw themselves as participants in a public policy-making process:

> The environment is the physical world in which we live, and anything that affects that habitat should concern all inhabitants. I attempt to inform them according to how much impact I perceive the event might have on their future existence.--Stuart Diamond, Newsday.

> An environmental writer on a major metropolitan newspaper today is at the cutting edge of the fight for a clean and healthy environment. He has the opportunity to lead his readers to assume responsibility for their clean skies, waters, forests, open spaces, and wildlife.--George Neavall, Detroit Free Press.

Such sentiments are not those of the "neutral" reporter; they are those, in a sense, of crusaders for a cause.

"Gatekeepers" at Work

White (196) and Gieber (54) introduced into the early literature of mass communication the concept of the editor as a "gatekeeper," selecting--rationally or not--from the flow of stories across his desk those relatively few elements that will make up the news of the day, at least in his paper. Perhaps to counter-balance the missionary instincts of environmental writers, we see in the following accounts some gatekeepers at work with a pretty heavy hand:

> City editors are gusto-minded. On a busy newsday, a story about an environmental impact statement and its uncertain list of alternatives soon loses out. Editors are not always sure what to do with our (environmental) stories. They don't always fit the conventional notion of "hard news." They are potentially embarrassing because they often deal with big business in the community, and the jobs big business provides.--Casey Bukro, Chicago Tribune.

> Newspaper editors are too caught up in the day-to-day, short-term stuff to handle environmental news properly. What they're looking for is a consumer-oriented mass slaying for page one. --Harlan Draeger, Chicago Sun-Times.

> Although this area is no more than a half-hour drive from a nuclear power plant, the subject is considered completely out of the realm of our reportage. Conservation, nuclear energy, pollution--they are all considered "the stuff of the 'environmentalists' (read 'crazies')," whose concerns are considered (by the editor) to be unreasonable restraints on development.--(not for attribution).

> The Chronicle has a fine new man on the environmental beat, and this city is thought to be an area in which interest in

> the subject is strong, but the play of his stories reflects neither his quality nor the assumed interest in the topic.--Bob Rothe, San Francisco Chronicle.

"Inventing" Environmental News?

By suspending belief in objective reality, Molotch and Lester (106) have constructed a scenario in which events--"news"--are the result of practical, purposive, and creative activities on the part of news promoters, news assemblers, and news consumers. By "promoting," Molotch and Lester mean that "an actor, in attending to an occurrence, helps to make that occurrence available to others." Thanks to Boorstin (9) and others, the concept of the PR man as an arranger of staged events is commonplace. To a degree "the environment" itself was the creation of Senator Nelson and the rest of those around that kitchen table in Madison in 1969.

Not so commonplace a concept is that of the media person himself or herself as a news promoter or arranger, not merely an assembler. Some environmental writers and their editors in this study were overtly conscious that the reporter can literally "make things happen":

> Our environmental coverage is neither so thorough nor so well organized as it was when (environmental reporter) was here. My feeling is that because the environmental movement does not receive the consistent coverage he provided, it attracts fewer and less diligent workers. Take away the environmental writer and there is actually less environmental news. Sadly, the quality of the reporting also declines.--David Levinson, (Long Beach, CA) Independent Press-Telegram.

> The environmental movement is keeping a low profile--or being forced into one by lack of coverage.--Stan Strick, Minneapolis Star.

News consumers can be news promoters, too:

> There is not a week, seldom a day, that some reader does not call in with information, questions, comment, or suggestions. --Florence Schaffhausen, (Doylestown, PA) Daily Intelligencer.

Varying Reporter Ideologies

The mass media are said to be in the business of "manufacturing and reproducing images," providing "the guiding myths which shape our conception of the world and serve as important instruments of social control," according to Cohen and Young (23). If that is so, at the nexus of environmental affairs and public are the environmental reporters. Their ideology may shape--overtly or covertly--their view of environmental affairs and hence their readers' view of environmental affairs (191).

To answer our request for generalizations on the state of the environmental journalism art today, many respondents also assessed the

state of the enviromental movement itself. Depending on which environmental reporter you attend to, the environmental movement today is either dying out or is infused with perpetual life:

The Environmental Movement as Fading

> The environmental movement here is practically non-existent... In the city itself there is no environmental agency...Our state department (of environmental protection) has been rendered almost ineffective by budget cuts, and its previous crusading image is just a memory.--(not for attribution).
>
> The environmental movement has become institutionalized. Many of the savviest environmentalists are now working for local, state, and federal governments, and thus subject to the slowdowns and political pressures of the bureaucracy. Left behind outside the government in many cases are those who are not as clever. And from the government I see an increasing tangle of regulations that often seem to skirt the issues.--Stuart Diamond, Newsday.
>
> Environmentalists have become common scolds. In terms of production and its pitfalls of pollution, the people here would rather get rich and die young.--Richard Grimes, Charlestown (WV) Daily Mail.

The Environmental Movement as Sustaining

> The environmental movement is less visible and less active than it was, but still around. The people who remain are the more dedicated and more effective ones, so their actual impact has probably not declined that much.--Harold Scarlett, Houston Post.
>
> The environmental movement and environmental reporting are not dead. Sun Day produced a fair splash. There is an environmental press all of its own. And the environmental issues are still hot. Probably the biggest story is whether government is able to enforce the environmental legislation already passed.--Gil Bailey, Washington Bureau, Knight-Ridder Newspapers.
>
> My assumption is that public concern and action about protecting and improving the environment is just beginning, and that my job will be to try to keep up with it.--Bob Modic, Cleveland Press.

While the clear dichotomy among environmental writers may stem in part from "real facts" in varied cities or regions, it also may reside in the pessimistic-optomistic gestalts of varied environmental reporters. For example, Bruce Ingersoll, Chicago Sun-Times, said "the environmental movement here is flagging; many of the citizens' groups have vanished like ephemerals." On the other hand, Casey Bukro, Chicago Tribune, said "the squeaky wheel of environmentalists" has led to significant pollution-control ordinances; "for example, even though our state is the fourth largest coal-producing state, and most of that coal is soft and high in sulphur content, yet you can't buy soft coal in this city; so you seldom see black smoke pouring out of a smokestack here these days."

For whatever reason, one cohort of environmental reporters in this study seemed to be on the verge of drafting the obituary of the environmental movement; another, a commencement address.

Professional Responsibility and Craftsmanship

Many occupations and professions within American society today are experiencing internal dissent over the definition of responsible professional practice. These self-criticisms are certainly characteristic of the journalistic community as a whole (80). Given the shifting sands of environmentalism itself, it is only natural that environmental reporters particularly would feel caught between the professional canons of journalism on the one hand and of ecology on the other.

As Rock (131) has said, the world is not arranged for reporting purposes, and this state is certainly true of environmental degradation. It rarely meets Hall's (66) three basic criteria of "news": it is seldom linked with (a) a "newsworthy" (b) event (c) occuring in the past 24 hours. It is not a spectacular, sudden landing on the moon; it is more like the imperceptible evolution of the moonscape itself. Little wonder that the reporter with ecological awareness is caught between the rock of newsroom perceptions of what is "news" and the hard place of what he or she believes to be environmental reality.

That some experienced environmental reporters are trying to work out an acceptable entente, these reasoned quotes give testimony:

> Too often, stories are written with one point of view or a limited set of facts, instead of showing how things relate to each other. How often do we see these relationships explored by the media? I'd like to see more "big picture" reporting--the kind that follows chains of events so the reader can understand, for example, why the snail darter is more than a three-inch fish and represents some larger issues. Given the changing and trendy nature of our business, environmental writers as such may be an endangered species. But, given the growing competition for limited resources, environmental issues will always need covering by somebody, whatever they call us.--Casey Bukro, Chicago Tribune.
>
> I get that burned-out feeling at times, but this job is still satisfying and gives me a feeling of accomplishment. Environmental coverage, here, and nationally, appears to me to be more intelligent, better balanced, and less strident than it was in the early 70's.--Harold Scarlett, Houston Post.
>
> Long-series (environment and energy) stories are being done by a cadre of well-informed specialists who publish too infrequently. The spot news stories are being done by general-assignment reporters generally unfamiliar with any but the most superficial considerations. Thus the public still depends for its daily environmental and energy stories on reporters not adequately experienced whose questions are not

> sufficiently probing and who depend on official handouts which often leave out essential perspective.--Stuart Diamond, Newsday.

Clearly, in the ranks of environmental reporters today there are at least some journalistic craftsmen with what Leopold (88) called an "ecological conscience," bent on performing a successful marriage between environmental issues and reader awareness, interest, and understanding, yet these craftsmen have a keen sense of the constraints under which any newsperson works.

ASSESSING THE ENVIRONMENTAL REPORTAGE OF THE MASS MEDIA

In a current overview, Chaffee (18) has summarized some 40 years of research on the effects of the mass media. At the outset, he emphasizes we must distinguish among three broad types of media effects: first, effects that can be attributed to a medium because of its physical properties and the sheer time a person devotes to it; second, effects having to do with the reception of information, the modification of behavior, and changes in feelings, opinions, and intentions to act; and third, effects concerning the unit of observation--individual, interpersonal interaction, or the activity of a larger social system.

Content-specific effects of the media are the most pertinent to this Monograph. Attitudinal effects were once assumed to represent an intermediate in a fixed psychological process that led from the intake of raw information to the exhibition of corresponding overt behavior. Evidence has now accumulated that the direction of causation linking attitudes to knowledge and behavior is ambiguous. A change in a broad social attitude can produce subsequent changes in expressed information, and attitude changes can follow forced compliance with a new behavioral standard. "Effective" communication may even be that which encourages a stable attitude, as when the media perform a therapeutic role in calming an audience in time of disaster or in dampening potential community conflict. If the media may not be especially powerful in telling people what to think, they can be quite successful in determining what people will think about. The issues on which most problem-solving effort is likely to be expended are those that people consider most important; to the extent that the news industry controls which problems will be addressed, it also determines which may get ignored. While several studies have found a widening knowledge gap that can be attributed to varying media influence on the relatively well-informed and the non-informed, some studies also indicate the reverse--that media inputs can bring the less-informed sector up to parity. The conditions under which each of these patterns can be expected to occur are not clear. In the final analysis, it may be that the psychological processes that intervene between media exposure and its effects are the crucial variables. All in all, Chaffee is convinced that the mass media are indeed influential societal institutions, but our understanding of exactly how, when, and why awaits further careful empirical analysis.

Chaffee introduces a novel aspect of mass media effects particularly relevant to any discussion of the media and the environment. As he points out, the sheer production of mass media is a large and growing sector of the economy of the United States and throughout most of the post-industrial world. As with all mass-production industries, environmental costs arise. For instance, the newsprint for the thick newspapers that most Americans receive each day consumes a great deal of wood pulp from forests, and paper production is a major river-polluting industry. Another familiar example is the home television receiver, which draws a significant amount of electrical power some five hours

each day in the typical household. The economic and environmental impact of the mass media on society has been little studied, and indeed has not ordinarily been considered part of "media effects" research at all, although it would seem to belong in any comprehensive cost-benefit analysis. What would be the result, for example, if the Sunday New York Times or RCA were required to file an environmental impact statement under a state environmental policy act? The ultimate current test of environmental reportage could well come in such a case, as did a test in a previous era.

If there was one thing at fault with yesterday's conservation reporting, it was its one-source habit, admittedly inherited quite naturally from the one-problem/one-solution approach of conservation individuals, organizations, and agencies themselves.

As it had become institutionalized, conservation had become compartmentalized. If one looks up "conservation" in a Readers' Guide to Periodical Literature, one finds no listings under that term per se; one is directed to "See Forest, Soil, Nature, Wildlife, etc." As the nation had identified various conservation problems, it had created discrete legislative acts and administrative bureaus to deal with what were considered discrete problems--the Forest, Reclamation, Park, Fish and Wildlife, Soil Conservation, Land Management, and Water Pollution Control bureaus, and so on. What one agency might do in its best interests could vitiate the work of another agency, and there was no agency serving as referee. As a President's Advisory Committee said (192), "Arrangements (to deal with conservation) have grown on a piecemeal basis...The current organization is a hodgepodge." Clearly, "conservation" was not a term connoting applied ecology--a systems approach to resource management. "Environment," on the other hand, now has its own extensive entry in Readers' Guide today.

In addition to its connotation of compartmentalism, the term conservation had another flaw--what can be called its "boondock" overtones. Its universally recognized symbols had become Smoky Bear and contour plowing, both associated with open country--"out there." The environmental problems of the '60's, however, were as much urban as rural, demanding an "umbrella" concept that would include "city" and "suburbia" (45, 128), not just the hinterland.

Certainly the conservation movement had involved and expressed a concern for the wise management of resources that might otherwise dwindle, but its major term was never used to imply an imminent threat to the human condition. What early environmentalists foresaw, instead, was humankind as the most endangered species of all. "Conservation," wrote Darling (34), has traditionally been concerned with natural resources,...but the science of applied ecology must now logically include the human species as an organism to be conserved." Zinn (203) as we have heard, stressed that "conservation is no longer just the story of vanishing wildlife and vanishing wilderness areas...As we stop and look at our total environment, it has taken on the meaning of human survival." Marx (98) asserted that "the philosophical root of the ecological perspective is the idea that man is wholly and ineluctably embedded in the tissue of natural processes," whereas the conservation

movement had merely "attracted people with enough time and money to enjoy the outdoor life."

Perhaps "conservation's" most serious shortcoming, however, was its strong associations not only with a nice-Nellie type of nature study, but also with Depression pump priming, resource "development," and national defense. For new-breed ecologists espoused a sort of counter-culture that some might consider "subversive" because it called into question the sanctity of the GNP as a measure of national well-being (175).

Little wonder, then, that conservation reportage was characterized by an egg-crate approach to issues, each problem pictured in its own little rural crevice, unrelated to profound urban, economic, political, social, and ecological tides. Today a principal challenge for the environmental reporter is to demonstrate that indeed everything is connected to everything else.

Under the rubric of "conservation," the mass communication system and public concern for natural resources did indeed have a long liaison (147). Sixty years later the dawn of an "environmental decade" tended to bring a new dimension to what Hughes called the essence of news--"a quickening urgency" (75). Where conservation had typically been concerned with dwindling redwoods, raptors, and open real estate, now many saw humankind as the most endangered species (15). For many people, a fragile, finite Spaceship Earth was beginning to replace the cornucopia as a symbol of America's future (60). The practical problem faced by the emerging environmental communicator cohort was how to recognize and describe sound, fair trade-offs among energy, economy, and environment. It was "a journalism of uncertainty" (120).

Once on the media agenda, how well as a whole have the media done in "constructing the environment as a social problem," to use the Albrecht and Mauss (2) terminology? The testimony is mixed.

Dana (32) said "the mass communication media of the country probably have more effect on the American mind than all of the schools and universities combined" with respect to conservation education--an effect empirical research has had trouble documenting.

After looking at San Francisco press performance in 1970, Rubin and Sachs (134) came down hard on the premise that "if environmental news coverage is to be of high quality, then massive structural, procedural, and attitudinal change (in the press) will be required." Althoff, Grieg, and Stuckey (4) felt that 1970 pollution coverage of Kansas newspapers was inadequate in view of the seriousness of the problem there.

Through its emphasis on environmental problems unaccompanied by mobilizing information about solutions or at least about options, Wiebe (197) scored the press for producing in its readers "a state of well-informed futility"--for lack of means for translating need into action. His antidote: that media gatekeepers look into a mirror and recognize "we have have met the enemy and he is us." As we have seen, Marx (98)

credited "the mass media" with beginning "to spread the alarm toward the end of the 1960's," and Faramelli (47) agreed that "during 1970 the ecological crisis was brought before the American public via the news media." However, Barkley and Weissman (5) said that was because the media were in the hands of "big business," which invented the environmental movement to divert the public from social ills and Vietnam.

That the media may be able to participate in, but not to complete, the process of preparing an audience to effect social change was suggested by a 1972 Michigan study (115) that indicated high media users considered themselves less informed about environmental problems, viewed issues as less serious, and preferred less personal solutions to problems. In other words, the media may actually be in the business of substituting vicarious experience in environmental issues for genuine involvement in their solutions, the authors speculated. Contrariwise, Maloney and Slovansky (97) concluded that the public was being stimulated and the professional obligations of the journalist were being fulfilled by and through environmental reportage. A recent study of Virginia 10th-graders indicated that higher levels of marine ecology knowledge were very positively correlated with high viewing of Cousteau specials on TV and on reading and recall of National Geographic (51).

Beane and Ross (7) found the media halting in informing the public on nuclear power plant issues. But Zimmerman, Scherer, and Larson (202) report that Pennsylvania environmental educators in public school systems make "frequent and regular use" of the media for background information on environmental issues.

Bowman (11) submits evidence that newspaper editors say they are continuing to report environmental news at a high rate, but Bowman believes that in fact a low priority is assigned environmental stories, that various problems associated with reporting environmental news are "not being dealt with," and that if the press is to do a more effective job of interpreting environmental issues "as one of the most important issues in the last part of the century," the press had better get on with it.

Since discovering the environment as a social problem in 1969-70, what the mass media "have accomplished at the level of arousing public awareness is close to miraculous in bringing citizens scientific and social knowledge heretofore unknown only to a few experts" is the verdict of an Environmental Protection Agency Official (198). On the other hand, Eisenbud (42) says that while much of media reporting is of high quality, "this has not been true of its coverage of environmental issues (because) reporters prefer to work with those scientists who speak in readily comprehended, albeit unqualified language... Reporters do not understand the need for scientists to equivocate." The Conservation Foundation Newsletter recently headlined the conclusion that "the media--in the search for the dramatic--are not able to cope adequately with the subtleties of modern environmental issues" (177). Sleeper was quick to draw a response from Cowen (30), Christian Science Monitor science writer: "Environmentalists have been less than candid--even dishonest--in dealing with the press. It is time they stopped acting like indecent special-interest promoters."

Tichenor, et al. (186), Sharma, Kivin, and Fliegel (174), Bowman (11), and Stamm and Grunig (180) have found environmental behavior to be "situational"; that is, a pro-environmental stance is easier to take when it doesn't "bite" the individual decision-maker directly, regardless of media posture on the issue.

But the insights or researches so far cited are what commentators or researchers say. What do the consumers of the media say?

A responsible national survey funded by Resources for the Future indicates that public support for environmental protection remains strong. The RFF study was designed to make as rigorous a test as possible of the hypothesis that "environmentalism is an enduring concern." The interviewing took place in 1978 just weeks after California voted for Proposition 13 by a 2-to-1 margin, and the media declared a "tax revolt" to be spreading across the country. During the interview period, the inflation rate topped 10 percent, and the well-publicized multimillion-dollar Tellico Dam stood uncompleted because of a diminutive but endangered snail darter. The results of the survey are striking. RFF reports that "although the respondents are deeply concerned about inflation and taxes, their support of environmental protection is strong and unwavering, and their sympathy with the environmental movement is at a high level, with no sign of a backlash" (104).

Efforts to control pollution, regulate new chemicals, develop environmentally safe energy sources and protect endangered species and wetlands are all supported by a strong majority of the American public, according to a national public opinion survey released even more recently by the Council on Environmental Quality (CEA). Nearly half of those surveyed (42 percent) felt that environmental protection is "so important that...continuing improvement must be made regardless of cost." Sixty two percent said their views are in sympathy with the environmental movement and 73 percent said the term "environmentalist" applies to them "definitely" or "somewhat." An overwhelming majority of 83 percent said that the government should screen new chemicals for safety before they are allowed on the market. Only one in five respondents chose the statement, "we must relax environmental standards in order to achieve economic growth." Solar energy was chosen by 61 percent of the population as the energy source which the nation should "concentrate on most." Nearly three-fourths of the respondents (73 percent) said that endangered species must be protected, even at the expense of commercial activity. And 65 percent felt that "marshes and swamps should be preserved." Copies of the 1980 report, Public Opinion on Environmental Issues: Results of a National Public Opinion Survey, are available from CEQ, 722 Jackson Place, NW, Washington, DC 20006.

If such survey results are accurate, it is hard to see how such a pervasive public attitude could have been developed in the absence of responsible environmental reportage on the part of the mass media. Has that reportage been accurate?

At least in the eyes of some journalism professors, environmental reportage is primarily a type of science writing. The interplay of scientists, reporters, editors, and readers has been the subject of a

good deal of rhetoric and research with respect to "accuracy." One of the main problems cited is an apparent tendency of the media to "sensationalize." Research into the coverage of environmental issues has shed some new light on the matter.

For example, Glynn (55) looked at editors' and reporters' attitudes toward "sensationalism" in environmental reportage, using a semantic differential scale based on elements shown to be components of "sensationalism" in previous research by Tannenbaum (184), Johnson (79), and Tichenor et al. (185). Editors consistently rated "sensationalism" as a more favorable characteristic of environmental articles than did environmental reporters. However, the research results suggest that the proportion of life spent in the news organization is more important in determining a respondent's evaluation of "sensationalism" than is the assigned role of either reporter or editor, tending to document Breed's assertion that the longer an individual is in a news organization--whether as editor or reporter--the more ingrained and "compatible" he or she becomes with the values of the organization, one such value being "the use of subject matter and literary treatment calculated to arouse excited interest and emotional response," which happens to be Webster's definition of "sensationalism" (194).

A lack of communication between reporters and editors is also evident in Glynn's data. When rating the amount of influence editors have on the lead, style, and subject matter of environmental articles, reporters and editors consistently differed in their responses. Editors felt the amount of influence they had was great, while reporters felt editorial influence was minimal. So not only may junior reporters not be responsible for the "sensational" aspects that enter their articles, they may be virtually unaware of or unconcerned about the subtle changes and influences the organization is exerting upon their articles.

Glynn (56) later analyzed representative press coverage of the Tellico Dam issue, a controversy that pitted a TVA project against a diminutive fish, the now-celebrated snail darter. With respect to "sensationalism" in covering Tellico, press performance represented by the papers studied could be rated at least passable if not pretty good. For example, only 9 percent of the local daily's and 11 percent of the national daily's headlines were found to be "sensational." When "sensationalism" peaked, it was due directly to the inherently "splashy" nature of the snail darter's role in the case.

The data seem to support two recent assessments of the state of the art of science writing:

Krieghbaum (89) finds that "science reporting has moved from the 'Gee Whiz!' coverage....Social implications have become increasingly important, and so have the politics of science." Dennis and McCartney (38) report that "science journalism and the science journalist are maintaining a high standard and even getting better."

For "science writing" one can read "environmental reporting," as a study already cited (142) indicates. Indeed, Leopold's (93) "ecological conscience" seems to have penetrated at least some newsrooms. Despite

an inherent turnover in personnel, some of the media today apparently is staffed by a cadre of old or new environmental reporters with an allegiance to environmental protection that transcends obeisance to environmental bureaus or organizations; that tries in various ways to surmount barriers of "newsworthiness" conventions, "gatekeeping" on the part of editors, "routinization" practices, and publisher "social control" to breathe some semblance of life into sustained environmental reportage; and that adapts professional responsibility and craftsmanship to the construction of a threatened environment as a "social reality" to which readers can relate.

American news media are part of a culture that, in Leopold's (94) words, is "remodeling the Alhambra with a steam shovel," and they are "proud of their yardage." They will "hardly relinquish the shovel, which after all has many good points," but many seek "gentler and more objective criteria for its successful use." "By and large," said Leopold, "our present problem is one of attitudes and implements." The attitudes and implements of the news media are in the environmental balance today.

A CASE STUDY IN ENVIRONMENTAL REPORTAGE

At midnight in the bitter depths of mid-winter, a Chicago, Milwaukee, St. Paul & Pacific milkrun train deposited a brash young reporter at the wind-swept, deserted depot of a small town in eastern South Dakota. His assignment: to investigate a mass murder. Shivering with both cold and uncertainty, he trudged half-a-mile to the town's one hotel and set up shop in a dingy room where steam banged and rattled and hissed in a vain attempt to pump some warmth into a reluctant radiator.

Early the next morning, he located an old Army infantry buddy from Anzio and hitched a ride through swirling snow squalls to view the scene of the crime, inspect the graves of the victims, and interview the perpetrators. It was a cinch. The countryside was figuratively strewn with dried blood at every hand, and the executioners literally marched up happily to tell their accounts of what had happened--and what, indeed, was continuing to happen.

The resulting story became what has been termed an "earth-shaking" lead article in Field & Stream magazine under the title, "Good-By Pot-Holes." The sub-title read: "Is the Soil Conservation Service destroying waterfowl habitat faster than Ducks Unlimited and Fish and Wildlife Service can restore it? Conditions on one of our most important breeding grounds indicate need for closer cooperation."

Arthur S. Hawkins, a U.S. F&WS flyway biologist, says the article "unleashed a chain of events like a nuclear reaction....It was the leaven that started the ball rolling, if I can combine metaphors, toward today's wetland preservation programs..., a great contribution to wildlife and humanity."

To get a feeling for what he might be facing, the reporter had stopped en route at the Twin Cities in Minnesota to chat with the regional F&WS chief, Dan Janzen. Dan, in his reserved way, was hopping mad. The waterfowl in his care were literally going down the drain. Taking the reporter to a big wall map, he sketched the situation:

In the 5,000 square miles in eastern North and South Dakota, there were an average of 20 pot-holes to the square mile, ranging in size from one-sixteenth of an acre to 100 acres. Together with surrounding sloughs, lakes, and uplands, the glacier-made kettles constituted one of the prime waterfowl breeding areas on the continent. Yet in just one Dakota county alone, 1,400 of those pot-holes had recently been drained, and there was talk of more and bigger regional drainage to come--a major threat to the Mississippi Skyway duck population, which Dan was charged with protecting, using in part the special taxes paid by duck hunters.

Who was doing all that draining? Well, farmers, of course. But there was more to it than that; just what, Dan was not at liberty to say.

With expense money for only five days, how could the reporter possibly cover 5,000 square miles? Why don't you concentrate on one typical county, Dan suggested. Did he have one in mind? Yes, Day County, in eastern South Dakota--the county seat, Webster.

So the reporter headed for Webster with its wind-swept depot. No less an authority than the present Director of the USF&WS, Lynn Greenwalt, says, "He really started something when he went to Webster that winter."

As we've said, it was easy to find the scene of the crime. Those 1,400 representative drained pot-holes were in Day County. Ranging in size from one-eighth of an acre to 90 acres, a total of 6,285 pot-hole acres had been drained by 38 miles of ditches. Some 350 farms were the sites. All you had to do was drive down any country road, get out of the car, climb a fence, and stand in a slight depression in a big wheat field, a depression that yesterday had been one of the homes of an incredible 33.2 breeding pairs per square mile--of teal, gadwalls, mallards, and pintails.

It was easy to find the graves of the victims, too. With the help of local biologists, the reporter made some rough calculations. Even assuming that only 60 percent-plus acres of drained pot-holes in Day County had held breeding pairs producing an average of seven ducklings each, that would still mean that Day County drainage to date had lessened duck production by some 26,000 ducklings a year. The famous Delta (Manitoba) Marsh had produced only one-tenth that many ducklings the year before. Plenty of Dakota duck graves, in other words.

What is more, as the Vice President of the Wildlife Management Institute, Larry Jahn, points out: "Ducks are members of a community; the graves represented losses of entire aquatic communities," with their varied plant and nongame wildlife species.

Now ordinarily when you have a mass murder like that, the criminals are conspicuous by their absence. Not so in Day County. They were simply delighted to identify themselves and talk for public consumption. It turned out to be an amoral alliance, funded by your federal tax dollars and mine.

First, of course, there were the farmers themselves. But they were just doing happily what society asks farmers to do--raise bigger and better crops as efficiently as possible and sell them as cheaply as possible to feed a hungry country and a starving world. With the price of wheat encouraging and the cost of arable land mounting, there was nothing in the equation to deter turning "nuisance puddles" into cropland--and Matt Mallard be damned: "If hunters would just stop shooting so many, the ducks will do all right, anyway."

Second in line, there was the United States Department of Agriculture's Soil Conservation Service, born in the Depression to bring a halt to dust bowls. Supposedly the SCS was set up to promote such salubrious land manipulations as grass-legume rotation, check-dam building, wind-break planting, strip cropping, contour plowing, and so on. But not in Day County then. At the top of its "approved farm

practice" list was "the construction of drainage ditches (to alleviate) depressional areas where continuous cultivation cannot be practiced because of periodic harmful accumulations of water." Did a farmer want to drain a pot-hole but didn't know how to go about it? "Why, we SCS engineers will lay out your ditch for free."

Next was the USDA Production and Marketing Administration (formerly the Agricultural Adjustment Agency, now the Agricultural Stabilization and Conservation Service). The PMA listed drainage ditches high among its "approved construction practices" in Day County. A farmer could collect 8 cents a cubic yard for ditching, and another 75 cents a thousand square feet for grassing the waterway. In one year PMA had paid the farmers of Day County $17,285 for digging 43 miles of drainage ditches.

"We're the bread-and-butter agency in this county," the Webster PMA director said, proudly thumping his chest.

Fourth member of the conspiracy was the Cooperative Extension Service, that remarkable link among the federal Department of Agriculture, each state land-grant university, and the agriculture committee of manifold county boards, with a ubiquitous "county agent" in every court house. From the State College at Brookings the CES was sending out bulletins extolling the merits of pot-hole drainage, and the Day County ag extension agent was serving as the very efficient secretary of the pivotal local Soil Conservation District, gleefully signing up "approved practice" farmers, meaning ditchers and drainers.

Last but by no means least were the manufacturers, distributors, and dealers of earth-moving equipment. In the best tradition of the free enterprise system, they were passing out calendars and caps in a push to sell, lease, or rent bulldozers and back-hoes: "We geared up to win World War II, and we aren't about to miss out on a fast buck now."

As a matter of fact, there was another member of the "good-by pot-holes" clan--the local public, represented, sad to say, by the editor of the Webster Reporter and Farmer, who said frankly, "Pot-hole drainage is one of the finest things that has happened to Day County agriculture in years....Besides, in a region where the economy is based entirely on farming, nobody opposes what the farmers are all for."

Well, hardly anybody, anyway. On his last day in Webster, the reporter did find some opposition that chose to be anonymous. An astute old game warden who showed him one grain field in which the surface area of the ditch equalled the surface area of the reclaimed pot-hole. A devout Audubon Society member who said, "They're crazy. In another five years the dust will blow their ditches shut." A courageous state game biologist carrying on a "stop the ditching" campaign. An editorial writer for the Aberdeen American-News, calling for "no more draining of sloughs and swamp lands...Any program that would rob South Dakota of its water reservoirs is short-sighted." And an F&WS refuge manager with those devastating statistics already cited--Fred Staunton, manager of the Waubay National Wildlife Refuge. The records clearly show that Fred Staunton was one of those fellows always bugging his superiors about what was happening to his beloved wetlands. By the time the reporter got to Day County, Fred had hard data. So the reporter got his facts.

Nationally, as you've heard Hawkins and Greenwalt say, "Good-By Pot-Holes" produced some reverberations. At the very least, it gave the F&WS a public hook on which to hang a drive to get wildlife values considered more fully in federal projects and programs, a drive that led more or less directly to a considerably strengthened federal Wildlife Coordination Act. Certainly today wetland preservation has a higher priority nationally and locally than it did in the past.

Milton Reeves of the F&WS calls "Good-By Pot-Holes" "one of the landmarks in popular conservation literature." Art Hawkins asks, "How could one man with a sharpened pen create so much havoc? 'Good-By Pot-Holes' showed me the power of words, for it stirred up a hornet's nest." In a recent anniversary issue, Field & Stream reprinted "Good-By Pot-Holes" as an example of its tradition of no-holds-barred reportage over the years in the cause of wildlife conservation.

The reporter has never gone back to Day County, but they tell him if he did, he'd find some of those drained pot-holes restored to duck production--a tribute to sportsperson dollars and F&WS diligence. A dawn wind in spring once more stirs across greening wheat fields, over phalaxes of willows, across bog-meadows heavy with dew, to dapple the waters of an ice-fringed prairie pond--then, out of some far recess of the Dakota sky comes the susurrant sound of waterfowl wings, and ducks are back in parts of Day County.

Lessons in Environmental Reportage

What does this case history tell us about environmental reportage techniques:

First, as Pryor (126) admits, the environmental reporter will always have problems: the shortcomings of biased public agencies and private experts as news sources, the bias of the reporter himself or herself, the political and economic pressures that accompany environmental disputes, the highly technical data than can easily be lobbed over the reader's head, and the pervasive problems of making a coherent whole of consensus options out of bits and pieces of conflict.

Second, environmental reportage calls for a more than ordinary amount of homework. Our reporter didn't plunge into Day County; he stopped for a briefing in Minneapolis. Before that he had done considerable background reading and talking to various breeds of agricultural scientists in his home city.

Third, there is no such thing as a one-source environmental story. Environmental issues have many facets, all inter-connected. Disappearing Dakota pot-holes could not be investigated and interpreted without talking to a wide range of individuals and interests.

Fourth, environmental issues call for unemotional, objective, self-disciplined reporting and writing. The effective environmental reporter talks softly but carries a big stick of statistics.

Sixth, when the statistics point clearly in one direction, however, there is no requirement that the environmental reporter equivocate. He or she is courageous in letting the chips fall where they may, provided he or she is explicit about the trade-offs required among ecology, energy, economics, and esthetics.

Seventh, environmental reportage can "make a difference." While a single story will rarely have the impact that did "Good-By, Pot-Holes," or a single book the impact of Silent Spring, or a single TV documentary the impact of "The Wolf Men," the cumulative environmental reportage of the past decade has unquestionably helped bring environmental awareness to millions of Americans and helped stimulate environmental action on the part of key individuals and agencies.

The challenge of environmental reportage in the decade ahead is one of facilitating a sober consideration of ways that will help enhance environmental quality and energy conservation without jeopardizing human needs, and that will help meet human needs without jeopardizing the quality of the environment and the quantity of our energy requirements.

As Leopold (93) wrote, "The practice of conservation must spring from a conviction of what is ethically and aesthetically right, as well as what is economically expedient." He did not say, "regardless of what is economically expedient." He was espousing a concept of enlightened environmental reportage. Leopold went on to explain: "A thing is right when it tends to preserve the integrity, stability, and beauty of the community, and the community includes the soil, water, fauna, and flora, as well as people." He did not leave people out of the equation. He was defining symbiotic relationships among the media, the environment, and the public.

(Note: This chapter appears, in modified form, in Waterfowl Flyways from the Arctic to the Tropics, edited by Arthur S. Hawkins; see bibliography entry 164).

LESSONS IN ECOLOGICAL PERSUASION

Communication effects with respect to environmental issues perforce take place within a congeries of historical, psychological, and social factors, most of which are not amenable to simple manipulation. What is more, lessons to be applied from the field of human persuasion are indistinct. In fact, communication scholars and researchers have been discouraged from carrying out much persuasion research lately, primarily due to a lack of evidence linking messages with persuasive intent to any long-range change in audience attitudes and, especially, behavior. But there are some points of departure and some points of guidance. To a brief examination of them this Monograph now turns its attention.

What Research Tells Us About Communication of Technical Information

Communication of technical information to non-experts is an incompletely researched and understood field, lacking systematic, cohesive programs of investigation, carefully building upon each other. Nonetheless, Bowes et al. (10) and Grunig (63) have recently compiled invaluable bibliographies of what seems to be known. Practical advice perhaps applicable to environmental management can be extracted from the researches they reviewed, if one is willing to make extrapolations and accept for now a certain lack of precision.

1. The public is by no means a monolithic "public." For example, a dairyman, a tree farmer, a recreational property owner, and a nature conservancy consortium may all be neighbors in the same township, but each may approach the matter of wildlife management on their lands from quite different perspectives. It is necessary in such a case to differentiate audiences and communicate to each segment with messages addressed to each particular interest.

2. Communication efforts should be spread over long periods of time. Short "campaigns" tend to differentiate the interested from the passive, leading in many cases to a well-informed minority but not to widespread awareness. There is actually the possibility of increasing rather than decreasing a "knowledge gap" in that informationally "rich" members of the public get informationally richer while the informationally poor stay the same.

3. An individual's ability to perceive "control" in a situation has much to do with how he or she evaluates pertinent information. The higher one's feelings of personal control, the more likely one is to "try something." Communicators need to acknowledge the particular problems they have in this respect in regard to environmental management. Devices such as advisory committees sometimes can help alleviate feelings of lack of control on the part of private citizens.

4. "Situational constraints," such as proximity to state or federal lands with their own disparate approaches to resource management, frustrate efforts to communicate with a homogenous audience in mind or even to assess public opinion in a clear fashion.

5. Expressions used may significantly affect public acceptance of technical information. For example, researchers have found different acceptance levels between those expressing support for more nuclear energy contrasted to those supporting more nuclear power plants.

6. The difficulties scientists, managers, and technicians have in communicating directly with the public, and perhaps more importantly in mutually satisfactory relations with reporters/editors, should be recognized early by those responsible for explaining environmental management options. In-house communication help in preparing materials would seem to be a useful step in lessening gaps and friction between professionals and their lay audiences.

7. The intent of much environmental management information to create favorable responses on the part of publics cannot work in ignorance of the powerful values in conflict, conflicts that restrict a person's freedom to change. By speaking realistically to what one individual can do within real or imagined constraints, the effectiveness of the message may be enhanced.

8. The strong possibility that many polls seem to create opinions for people to hold, and in some cases even suggest an opinion rather than measure the opinions people have--this hazard must be taken seriously by those investigating public attitudes and problems in environmental management. Polls done in ignorance of the "contamination" possibility may confuse real public opinion with results that merely echo attitudes of the sponsoring agency. At a minimum, survey respondents should be given "unloaded" questions and be provided the opportunity to reply that they in fact may have "no opinion" on certain matters.

9. Research into "readability" supports the use of the traditional rhetorical devices taught in English composition classes--simple words, short sentences, relating the unfamiliar to the familiar, graphs, charts, illustrations, example, parable, and, in particular, metaphor. The more "passive" the use of the message on the part of an audience, the more important are such "readability" techniques. However, the recipient who perceives a "functional" use for the message can apparently overcome gross lack of readability, especially if the expected value of the information is greater than the cost of the work to obtain and decode it. Illiterate Chilean peasants, for example, have been known to walk miles to find someone who could translate an agricultural bulletin the peasants assumed to be of practical use.

10. Administrators play a key role in successful public communication by technical agencies. Some administrators are adept at communicating technical information; others muddy the waters. Professional communicators of technical information themselves can be "co-opted" by the agency "system," losing touch with lay audiences.

11. While at any particular time and place a particular audience may pay more attention to a particular medium of communication, any sustained program of persuasion must employ a "media mix" if it is to stand a chance of being effective, provided the messages are so orchestrated as to reinforce each other.

12. Of paramount importance is the repeated research finding that what an audience brings to a message--that is, the reason they pay attention and what they expect the message to provide--may have more to do with what an audience member carries away from that message than does any characteristic of the message itself.

The principles just distilled from Bowes et al. and Grunig are at the heart of most successful advertising and public relations campaigns. But blind, prescriptive acceptance of such strategems ignores the slim, situationally-constrained bases upon which much of the strategy has been developed and tested. Environmental management is in so many regards a unique problem that communication of technical information about the subject may require experimental approaches, properly evaluated.

Science Education Perspectives

Writing from the somewhat related perspective of science education, Lucas (95) has made an exhaustive review of the empirical literature and concludes that "evidence that attitudes lead to appropriate behaviors or actions is not strong." He particularly emphasizes that private environmental attitudes are independent of public environmental attitudes and may be more difficult to change. In studies of family planning, for example, a majority of members of Zero Population Growth who argued that the United States was past its optimal population size, and who preached that a single-child family was required for immediate stabilization of the population size, nonetheless intended to have two natural children themselves. An anecdote further illustrates the point: a bumper sticker reading, "Save the Whale: Boycott Japanese Goods"--on the back of a new Toyota!

While knowledge about an environmental condition is probably a necessary condition for appropriate action, it is not a sufficient condition. Knowing that a stream is contaminated by winery wastes which increase the demand for oxygen in that stream will not guarantee that the producer, regulatory authority, or public groups will act to restore the stream to pre-industry condition. Indeed, Lucas cites evidence that general public support for environmental measures may fall off as people learn more about the specific nature of the issues involved and interpret the proposals for restriction as possibly harmful to local community interests. Studies also have found that secondary school students in Australia, England, and the United States have positive general environmental attitudes--except when the object of concern impinges on their own lives.

Because general attitudes about the environment may not translate into specific attitudes about specific issues, Lucas suggests that "perhaps we ought to concentrate on the direct modification of behavior rather than on intervention at the attitude level." Such an approach is generally outside the American ethos, however.

Ross (133) offers an important obiter dictum:

"True, there is very little evidence that attitudes and behavior are related in a predictable way. Perhaps that is because we don't ask the right questions or the right set of questions, rather than that behavior is fickle. There is obviously a fundamental relationship between attitudes and behavior. It is also obvious the relationship is dynamic rather than static. Perhaps many social scientists still expect the relationship to be deterministic (cause and effect) in the narrowest sense, when, in fact, behavior is stochastic (random within certain boundaries and patterns). We simply do not always behave the way we should if we were market-oriented. Such is not irrational; it is simply that we don't have an accommodating theory as crisply defined as we do for market behavior. What we need to do is to expand the definition of 'value,' and as we do, I believe we will come out with strong theories that will explain the undeniable relationships among attitudes and behavior."

What Instructional Message Design Research Tells Us

Fleming and Levie (50) have performed a service in distilling from many researches in the behavioral sciences certain principles applicable to the design of instructional messages, although at the outset the writers emphasize that while the principles can inform the creativity of designers, science has not replaced artistry and intuition.

Perception is a complex process by which we receive or extract information from the environment. There is little merit in applying principles of persuasion to what a person has not accurately selected out of an array of stimuli nor given adequate perceptual processing. Perception is relative: hence, provide anchors or reference points to which perception can be related. Perception is selective: limit the range of aspects presented. Perception is organized: make apparent the organization of messages. The better an idea is perceived, the more feasible and reliable will be further cognitive processes: memory, concept formation, problem-solving, possible attitude change.

When addressing attitude change, Fleming and Levie concede there is considerable question whether information-versus-propaganda and teaching-versus-persuading can be validly discriminated. Whatever, it is clear that attitudes impact upon perception and learning. Attitudes may affect perception through vigilance (people are on the lookout for things they enjoy), or through distortion (people sometimes misinterpret objects and events to be consistent with their attitudes). Similarly, people generally learn and retain information which agrees with their attitudes better than they learn counter-attitudinal information.

While a great deal seems to be known about how people modify their attitudes, attitude change is an extremely complex process in which numerous factors interact. Yet, given that a receiver is not previously utterly committed to a hostile viewpoint, given that the nature of the situation and group influences do not preclude change, and given that the communicator can engineer the perception and comprehension of the

message, it is not unreasonable to expect that the use of appropriate designs can contribute to persuasive effectiveness. But as to which designs are to be employed by which persuaders in which situations to which audiences, Fleming and Levie offer "no magical solutions."

What Experiences in Technology Transfer and Human Behavior Tell Us

Few fields of communication research have been as thoroughly tilled as that of what has been called "innovation diffusion" and what is now called in some circles "technology transfer." Originally developed to try to explain the adoption of hybrid corn seed by Iowa farmers, this perspective has been employed in such diverse areas as education, marketing, health, and defense programs. The basic findings may be applicable to natural resource management. Muth and Hendee (110) have recently summarized what seems to be known about the classic diffusion-adoption model.

An important factor accounting for different adoption rates is the nature of the innovations: relative advantage, compatibility, complexity, trialability, observability. For example, wildlife management on private lands is incompatable with some deep-seated owner values and needs; it is complex; its trialability is not simple; and its observability is long in coming.

Five stages are generally recognized in the decision-making process of individuals. In an awareness stage, an individual is first exposed to an innovation idea. In an interest stage, the individual may seek more information about an innovation and consider if and how it applies to him or her. Individuals who progress to an evaluation stage make a mental applicability of the innovation, weighing the benefits and costs, complexity, trialability, and other considerations. Some individuals next move to a trial stage in which they actually experiment with the innovation. Trial leads either to adoption or rejection or something in between.

According to the model, diffusion within a social system typically is distributed among various types of individuals: innovators, the venturesome; early adopters, respected community models; early majority, the deliberate; late majority, the skeptical; non-adopters, laggards, or defenders of tradition, depending on one's point of view.

The mass media seem to be effective in stimulating awareness. Specialized media serve the interest stage. At the evaluation stage, inter-personal communication appears to be necessary--consultation with friends, neighbors, peer contacts, and such "change agents" as extension personnel and salespeople. Personal contacts likely are important in the trial stage as well. (For a perhaps over-simplified example of a change agent supposedly at work in the interest-trial-adoption process, one can consult a typical beer, detergent, or pill TV commercial: "Well, I'll be darned. Brand X does (taste, clean, cure) better. I'm going to switch to (Suds-Lite, Suds-All, Suds-San)").

The social system of which he or she is a part defines a range of tolerable behavior for an individual and substantially dictates the

effectiveness of diffusion and adoption strategies. Traditional norms mean a negative attitude toward change; they can be a nearly insurmountable barrier to innovation. Modern norms favor change, and make innovation acceptable. Most people belong to several social systems, which may or may not be compatible.

This tour of the sociology of technology transfer emphasizes that success depends heavily upon the characteristics of the innovation as well as on the social system of which the potential adoptor is a part. The transfer process, according to the model of diffusion, is essentially a rational one, and cheerleading is no substitute for knowledge of the innovation and the constraints in the path of its adoption. A successful trial must be initiated by what the particular society sees as a credible practitioner. Once opinion leaders have become involved in the process, the process cannot be controlled, since those leaders can transmit their ideas and opinions to their peers in the social system, who in turn may transmit their ideas and opinions. Thus it is important to be certain that an innovation is ready for trial before advertising it. Communication of this kind through mass media is of greatest utility when tied to inter-personal communication. Individuals who can communicate new ideas to identified opinion leaders are essential. Creating an effective system of these "linkers" might do as much as anything to speed enlightened environmental management. So might the involvement of publics in biological or social research problems so they share "ownership" of resulting innovations and thus in some measure a responsibility for their implementation.

Information diffusion leading to technology transfer assumes large numbers of individuals making rational decisions, in terms of the market, that will benefit the adoptor. What would be the rate of adoption of constraints on or regulation of behavior in a situation where government decides to force abstention? We don't know, yet constraint, with some alleviation of the consequences of restraint, might be the most effective way to attain desirable environmental management on private lands (133).

The diffusion model is controversial, and at least one scholar (18) has observed that the classic curve of diffusion in society, plotted against time, is simply a normal ogive, representing randomness rather than process. Departures from this curve--accelerators and decelerators, for example--are the matters of real interest. Thus we can recommend only caution in any simplifed application of the technology transfer model.

Identifying who the opinion leaders are, for example, is not an easy task. The Yellow Pages have yet to list anybody under such a heading, and research shows them to be an ephemeral lot. In their review of the literature on opinion leadership, Severin and Tankard (172) note that opinion leading depends on topic and time, so that who leads and who follows depends a lot on the subject matter at hand. Thus we are concerned about identifying primarily those whose influence concerns matters such as agricultural or land use practices among a circle of acquaintances at the time. Empirically, opinion leaders are

often identified through self-reports and nominations from others, the best method being to triangulate the results of at least two reliable identification strategies.

Research has also revealed some characteristics which point to the role of opinion leaders within primary groups and also serve to distinguish them. Opinion leaders first of all tend to be perceived by their followers as personifiers of values held in high esteem by the group, such that others wish to emulate them. Severin and Tankard note that people do tend to associate with others like themselves, and the sharing of influence in primary groups functions primarily to maintain the similarity of opinions and behavior within that group. (Influence has been found to be bi-directional to a great extent, resulting in more opinion-sharing than opinion-giving, at least regarding public affairs matters.) The leader is also perceived by followers as competent and knowledgeable in the subject matter, and usually occupies a strategic niche among circles of acquaintances, so that he or she is accessible to others within the group and has some valuable contacts outside the group--including specialized media--which can be tapped for special information on topics important to the group.

In regard to diffusion of innovation, a peculiar circumstance is interwoven with the process so that there is often a certain dissimilarity rather than similarity among individuals who interact. Severin and Tankard explain that "new ideas often come from people who are quite different from the receiver," which presents some barriers to effective communication, since the source and receiver may not share attributes such as educational level, values, beliefs, or social status. Such differences need to be taken into account in designing information and education programs regarding innovative environmental management practices and policies.

What Communication as Complement in International Development Tells Us

Under the aegis of the Agency for International Development (AID), battalions of American specialists in technology transfer took off throughout the world to introduce all manner of innovations, armed with the belief that communication could bring about economic development. They have filtered home sadder but wiser, having discovered that it is economic development that creates a need for communication. Grunig (63), for example, observed personally in Columbia that constraints were so strong in that underdeveloped country that few peasants had the latitude in their behavior to make use of technical information or to adopt innovations. Large landowners, in contrast, were faring quite well economically using traditional agricultural practices and recognized no need for change. Hornik (74) has recently summarized what overseas experience has taught us about the strengths and weaknesses of the technology transfer model.

While it seems to be true that communication technology, when used directly in an educational process, can provide a backbone to both organize and maintain change in a resistant environment, and while it seems to be true that taking advantage of the special qualities of a variety of media through carefully designed software may enable the

development of a different instructional process equal to face-to-face instruction, and while it seems to be true that communication technology can magnify the ability of a population to speak to the central institutions which affect them, nonetheless if we have learned anything it is the importance of ripe circumstances, of right context, of making communication activities fit as a complement to other activities, and that communication interventions must complement or be accompanied by changes in resources or environments. The most repeated conclusion of development researchers interested in persuasion via mass media is that effectiveness is magnified by complementing media messages with local audience groups organized for listening, discussing, and deciding.

In sum, while communication technology can take many roles in development, its success in those roles depends on how it is done and in what circumstances. Hornik's message is one of caution and of a field not yet mature.

What Research in Environmental Public Relations Tells Us

There is occasional evidence in research literature that a public information program can in fact produce a particular public action. Chaffee and Ward (20), for example, presented evidence that a newspaper campaign had helped sell a school bond issue in a small community. More recently, Schnelle et al. (139) reported on a newspaper campaign that seemed temporarily to reduce litter in a small city. But the overwhelming evidence offered by Grunig (61) in a thorough review of the literature of environmental public relations research was to the effect that attitude change is rarely if ever achievable through short-term communication efforts, and that attitude is not necessarily a predictor of actual behavior. For example, Chaffee and Linder (19) came to believe that while a person's evaluation of an attitude object may be influenced through information processing, those effects do not necessarily carry over to corresponding changes in the person's directed behavior toward the object.

Public relations research does generally show a positive relationship between communication exposure and level of knowledge; the causal order is not really clear, however. But research also suggests that level of knowledge about a resource management issue may be inversely related to an ecological attitude on that issue when economic self-interest or some other stance intervenes. For example, the author would undoubtedly test out very highly in terms of detailed knowledge about a U.S. Navy plan to erect a massive underground radio cable network in northern Wisconsin and Michigan capable of communicating at great range with submerged Trident submarines. But that doesn't mean he sides with environmentalists strongly opposed to the high priority Navy project. The cold warrior in him supercedes his ecological conscience to the end that he supports the ELF project in the name of national security.

While environmental information alone simply will not necessarily change behavior, media amplification is not without consequences in some cases; new information may reinforce a pre-existing attitude. For example, people with a strong anti-pollution attitude may change their attitude toward a particular product as a result of information that the producer or product is a serious polluter. Once the new information has

been accepted and integrated, basic attitudes may shift a degree, and an even more extreme piece of information becomes acceptable, and so on. Deliberately to orchestrate such a staged campaign raises significant ethical questions, but mass communicators sometimes practice the strategy, by accident or design--and we gradually adjust to the notion that the Vietnam War is a nightmare, that Richard Nixon is culpable, or that the most endangered species is humankind itself.

Attempts at attitude manipulation have an inherent weakness: they presuppose that public relations is something that a person or an agency or an institution practices to get other people to do what the communicator wants them to do. Attitude manipulation has a simple appeal for agencies with a fixed model of how others should behave and who look on PR as a "quick fix" for eliciting that behavior. According to this approach, communications change attitudes which in turn program people's behavior. Grunig calls this attitude model the "domino model" of PR. If we can just communicate with people, according to the model, the communication domino will topple the attitude domino and that will topple the behavior domino. In fact, social psychology research suggests that such attitude models have little explanatory power. One message seldom leads to one attitude and one behavior. The dominos don't always fall in the same direction. People have free will. They control to a large extent their communication, their attitudes, and their behavior. We cannot control all three with a quick PR fix.

Grunig has proposed a "situational" model. It suggests that the way a person perceives a situation affects whether he or she communicates about a situation and how he or she communicates. Four factors are involved. Problem recognition represents the extent to which a person recognizes that something is missing or indeterminant in a situation so that he or she stops to think about the situation. Constraint recognition represents the extent to which a person perceives constraints in a situation which limit his or her freedom to construct his or her own behavior. A referent criterion is a guide or rule-of-thumb learned in previous situations which a person uses with discretion in a new situation. Level of involvement is the extent to which a person perceives a direct connection with the situation.

All in all, on the basis of recent studies with his colleague Keith Stamm, Grunig has concluded that environmental attitudes and actions are "situational." In other words, there is probably no such thing as a pervasive "land ethic," any more than there is an all-encompassing "Christian ethic." If such is indeed true, not even a member of the Sierra Club or of Friends of the Earth will be on the side of the angels on all issues concerning environmental management.

The Case of the Press and the Snail Darter (163). Environmental resource managers frequently attempt to use the press to help gain public acceptance of management plans and policies. But the press has an agenda of its own, which may or may not coincide with that of the environmental agencies. For example, "the use or effect of subject matter or the literary treatment calculated to arouse excited interest and emotional response" is a working definition of the "reader appeal" journalists seek in trying to sell newspapers to sustain a free press,

and at the same time it is Webster's official definition of "sensationalism." So the professional newsperson inevitably flirts daily with annoying if not scandalizing the environmental community, and the environmental management person may inadvertently play into the hands of the press. Such seems to have happened in the case of the celebrated snail darter versus TVA's Tellico Dam in 1972-1979.

A study (56) has analyzed representative press coverage of the Tellico Dam issue. "Sensationalism" was associated principally with the snail darter angle, and principally in turn with sources quoted in stories, not to newsperson interpretation. The conclusion: when environmental management persons introduce a "splashy" angle into an environmental management controversy, the response of the press is predictable. The case of the press and the snail darter recalls a classic case of the resource management community over-playing its hand in a 1937 Grand Canyon archeological expedition staged by the American Museum of Natural history and promoted personally by the Secretary of Interior. The press willingly treated the event as "a great human-interest story," only to be accused by scientists of "crass sensationalism" (100). It is at least an open question whether environmentalists were wise to stake the reputation--indeed, the solvency--of that movement on a confrontation that would pit a diminutive fish against the massive historic forces of industry, economics, conservation, and politics represented by the Tennessee Valley Authority, and in a press climate which would guarantee that coverage of any substantive issues would be inundated by the attention paid to the "excited interest and emotional response" inherent in the snail darter and its fate.

While recent national surveys (61, 142) indicate the daily press is increasingly staffed with a cadre of environmental reporters that adapts professional responsibility and craftsmanship to the construction of a threatened environment as a social reality to which readers can relate, that same daily press will never be immune to charges of "sensationalizing" when presented with "a great human-interest story" by the environmental management community. Significantly, the "Stop Tellico" campaign was a grass-roots campaign; the large national environmental and resource organizations and agencies lent only token assistance (125). Seemingly, national conservation leaders were applying an old military maxim: if you are going to fight, pick a battleground favorable to your tactical capabilities and strategic objectives. They may have seen in Tellico environmentalism's Vietnam.

Environmental resource managers continuously face the challenge of discovering and explaining management options in an unemotional, objective, self-disciplined manner. When they do, the press will usually meet them half-way. If resource managers create "media events," they run the risk of losing virtually all control of the flow of public information.

What Recent Persuasion Research Tells Us

An American president is attempting to persuade citizens that they will no longer be able to use energy in the way they have become accustomed to; oil companies are attempting to persuade the American public that

their profits are not excessive; the OPEC nations are hiring a public relations firm to persuade the peoples of the world that OPEC is not the cause of oil shortages. On this and many other issues various groups are expending a great deal of money and, ironically, energy in persuasion. So there is a magic persuasion button that a group can push to get its idea across, right? Wrong. Roloff and Miller (132), in an exhaustive review of new directions in persuasion research, leave the reader with a potpourri of theories but no cook-book recipes.

For example, while persuasion in a democratic society is by definition devoid of coercion, in actual practice a persuasive message is much more effective if it is perceived as having elements at least indirectly coercive. A carrot masquerading as a stick, in other words. The receiver's self-awareness affects the persuasion process, and the self-awareness depends on the situation. One's own thought rehearsal induces more persuasion than message-argument rehearsal. While source credibility affects persuasion, people choose to participate in the process of persuasion with others who are most likely to satisfy needs and achieve goals which are most salient and important at the moment of choice; we choose as communicants in a given persuasive situation those people whose characteristics most nearly satisfy the criteria we have established for that situation. In other words, there is no flat answer to the question, "Would you buy a used car from so-and-so?" On whether homo sapiens is essentially rational or emotional there is no agreement. Should the opposition try to get a zoning ordinance defeated by telling the city council about the potential loss of wildlife, or by pointing to the venality of the company wanting the change? Research results offer no clear-cut answers to such questions. Some research suggests that messages using relatively low intensity language are more persuasive than messages arguing very intensely; other research suggests that the opposite is the case in some situations.

While the concept of persuasion has a clear and important focus in marketing, and while Madison Avenue invests significant amounts of capital in what are thought to be persuasive advertising messages, even the most sophisticated research has not been able to explain without equivocation how such information is processed within the framework of consumer problem-solving behavior. Apparently a great deal depends on whether or not the receiver is a "spectator" to or a "participant" in the process. For example, the popular conception that Great Debates play a pivotal role in presidential campaigns seems to be over-estimated.

It would be nice if Roloff and Miller offered tested 1-2-3 approaches to persuasion, but such is not the case. While persuasion continues to be valued as an instrument of a democratic society, its practice remains an art and not a science. What one can say is that in the rough-and-tumble world of everyday social conflict, as distinct from the polite confines of drawing-room controversy, coercive potential determines the relative impact of most persuasive messages.

What Strategies of Environmental Interpretation Tell Us

Educators acknowledge it is a mistake to assume that behavior automatically will be modified as a result of either knowledge gain or attitude change or both, or even that changes in knowledge and attitude

are necessarily related. On the other hand, some research does in fact suggest that environmental education programs are associated with apparent knowledge gain, attitude change, and behavior modification. Cangelosi (17) has recently synthesized such research under various strategies applicable to what the National Park Service terms "environmental interpretation."

Reinforcement theorists view attitudes as a response, and like other responses, in their opinion, attitudes can be altered by changing rewards and punishments. They present data to suggest attitude change can be facilitated by novel or intense communication stimuli, by moderate fear appeals, by a punishment-oriented approach, by a factual approach, and by a reward in the form of a persuasive message with an explicitly drawn conclusion.

Functional theorists posit that attitudes serve certain functions for the individual: understanding, need satisfaction, ego-defense, and/or value expression; and that in order to understand or attempt to change a given attitude, it is necessary to understand the function or functions it serves for a person.

Cognitive dissonance theorists believe a state of tension occurs whenever a person holds two cognitions that are inconsistent. In order to reduce the tension, the person may discredit the source, misperceive or misunderstand the communication, or be especially attentive to consonant information only. Particularly, a person who is deeply committed to his or her point of view may only "hear" the side of the argument that supports his or her existing view; hence education often is ineffective that attempts to change deep-seated attitudes.

Environmentalists sometimes benefit from the cognitive dissonance model at work. Take the issue of recycling, for example. Many people start recycling their cans, bottles, and newspapers not because they are really concerned about resource scarcity or waste disposal but because of some neighborhood pressure. But this motive does not sustain the inconvenience of recycling, so they go seeking information that will help resolve their dissonance, and they may wind up forming an attitude of genuine ecological concern. Beginning recyclers, then, often become concerned because they recycle, not the other way around, and in such a phenomenon may lie the greatest value in otherwise-token campaigns (137).

Reactance theorists disagree with the cognitive dissonance concept. Instead, they believe that if a decision is irrevocable, or as the time to make a decision approaches, "pre-decisional convergence" can occur; that is, the subject will see two options as equally attractive. For example, faced with the inevitability of induction, a draftee may switch from conscientious objection to armed forces conformity. On the other hand, reactance supporters believe that when one's set of free behaviors is eliminated or subject to threat of elimination, there comes a drive to retain or re-establish the threatened or eliminated behavior. The reaction to the Volstead Act comes to mind.

In summary, in spite of the difficulty of the task, and in spite of varying concepts of what happens and why, certain educational approaches seem to be able to be employed which may have a potential for beginning to get people to rethink their positions on various topics.

What Experience in Reforming Private Land Use Practices Tells Us

The private landowner's irritability is rising over the legal hurdles which continue to interpose between land ownership and land use. Whatever mechanisms we use to protect wildlife, for example, they must be equitable to succeed. There must be a give-and-get relationship between landowner and public. The land developer and the environmentalist can, together, find better solutions than those of the regulatory agency or court. So says Kuperberg (90) after a decade of developing a constituency for the land and its wildlife--involved and informed individuals.

History has shown how the ownership and use of land perverted ecological functions, with increasing infringement on wildlife habitat. But wildlife will likely not be saved if the price is further unilateral loss of private land use rights. The challenge of today is how to allow for both humankind and wildlife in private land use. Kuperberg's answer is by diverse means and by encouraging innovation, showing the value to humankind of wildlife and natural systems. We must lead, encourage, and commend, Kuperberg says, the private land users and decision-makers whose actions protect natural systems. In short, we must make the enhancement of wildlife and its habitat as exciting and challenging as it has always been to conquer, exploit, mass produce, and demolish.

The incentive Kuperberg offers is relief from excessive regulation, contorted codes, outdated ordinances, and leaky legislation. The public's power to grant such relief can represent significant cash benefits to private land owners who, he says, presently lose millions of dollars a year to zoning battles, building codes, labor contracts, and transportation laws which waste energy, resources, and time. The public's representatives can grant each measure of relief in return for an equal measure of guaranteed future for natural ecosystems. These tradeoffs can be initially accomplished through restrictive covenants, transfer of development rights, land banking, planned unit development, variance, special consideration laws, and other legal mechanisms already in existence. After successful land use models are underway, legislation can be reconstructed to encourage further the spread of wildlife-sensitive land uses.

As an aid to widespread acceptance of such ideas, a method of assessing the real benefits to free enterprise and society in general is required--a conversion table and yardstick for measuring values to humanity in terms all can understand. Kuperberg suggests the elements for creating such a measuring device already exist: energy accounting and stress-benefit taxation.

Kuperberg offers a number of examples of his approach at work. The sequence he describes sounds remarkably like the innovation diffusion model: venturesome individuals who care, people who synthesize new

solutions and then help make them happen, successful projects that will lead to duplication, codified broad public opinion represented by changes in law.

What a Sociocultural Orientation Tells Us

Given the import of social relationships to an individual, some research has focused on the ways in which one's perceived relationship to others could modify behavior. As we have said, Miller (103) observes that much persuasive discourse is at least indirectly coercive, relying on threats and promises, and their credibility. A lot of these attempts at friendly persuasion rely on a notion of social approval or disapproval of a given action as the primary form of indirect coercion. Such an approach, obviously, underlies many advertising messages for products ranging from dandruff shampoo to laundry detergent.

A sociocultural model of this kind is explained by DeFleur and Ball-Rokeach (37), who note that variables such as an individual's organizational membership, work roles, reference groups, and primary group norms can shape overt behavior in ways relatively uninfluenced by personal predispositions. One function of groups, they note, is to provide members with shared definitions of reality--including appropriate interpretations of phenomena and prescriptions of proper behavior--via consensual validation. The role of communication and persuasion, according to this model, is to give people "new and seemingly group-supported interpretations--social constructions of reality--regarding some phenomenon toward which they are acting."

Following from the model, the communicator can be in a position of getting around the consensual validation process by leading the audience to believe that some interpretation or behavior has been socially sanctioned by groups relevant to them. This approach would perhaps be the most effective in regard to "new" phenomena--ideas or innovations as yet culturally undefined regarding interpretation and behavior. In American society, note DeFleur and Ball-Rokeach, "individuals are members of groups that are of significance to them, but at the same time the social organization patterns of such groups are sufficiently complex, contradictory, and heterogeneous so that modes of reaction to new issues are not uniformly prescribed." Thus information about acceptance of "innovative" resource use techniques by others important to the individual, and reports of their behavior, coupled with suggestions of social and cultural norms which would reinforce acceptance, could play a role in effective environmental management.

Distilling What We Know Into Guidelines

Communication as education takes place within a congeries of factors, most of which are not amenable to simple manipulation. Attitude change is rarely if ever achievable through short-term communication campaigns, nor is attitude necessarily a predictor of actual behavior. Ecological cognitions do not necessarily lead to an ecological conscience nor to ecological action. Although the mass media may stimulate awareness of ideas, most human behavior and attitudes are

rooted in an individual's social ecosystem. The most repeated conclusion of researchers interested in persuasion is that effectiveness is magnified by complementing media messages with local audience groups organized for listening, discussion, and deciding. Thus a cooperative adult education mechanism, linking federal and state instrumentalities with local groups in an essential two-way flow of communication, may provide the best single model for helping to achieve environmental management. If there could be a measure of covert coercion associated with the communication, its persuasiveness would seem to be enhanced.

ENVIRONMENTAL COMMUNICATION: FAD OR FIXTURE?

So whither environmental communication? Russell Train, former head of the Council on Environmental Quality, thinks the future of the environmental movement will depend on "reconciling environmental, social, and economic goals; on shifting from pollution control to pollution prevention; and on the general public's commitment to environmental protection" (160).

What in fact do public opinion polls tell us?

Drawing on results of 1977 Gallup polls, Sierra Club head McCloskey believes a public commitment to environmental protection has been "consolidated by the majority into an enduring American value" (158). After contacting opinion leaders around the country in 1978, Delong of the United Press agreed in a series of newspaper dispatches that "the environmental establishment may turn out to be the single most powerful force shaping the lives of Americans for years to come" (159). A 1979 Wisconsin study indicates eight out of 10 persons in that state are still "very" interested in their environment, and nearly seven out of 10 believe taxes should be used to fund environmental information programs. Interestingly, asking a specialist or attending a course are not preferred ways to get environmental information, the study showed. Most respondents get their environmental information from newspapers, radio, television, or magazines--and they put the information to practical use in their homes, on community issues, on their jobs, and in recreational pursuits, they say (85).

In what is perhaps that most definitive national poll, a survey of current public opinion on environmental and energy matters was conducted in 1978 as part of a Resources for the Future study of the environmental movement. The RFF study was designed to make as rigorous a test as possible of the hypothesis that environmentalism is an enduring concern. The results of the survey were striking. Although the respondents were deeply concerned about inflation and taxes, their support for environmental protection was strong and unwavering, and their sympathy with the environmental movement was at a high level, with no sign of a backlash (104).

Environment magazine says environmentalists seem to have demonstrated they can at least make the environment a troublesome political issue and one that has to be dealt with: "Many members of Congress would just as soon avoid getting themselves into a situation where they have to take on the environmentalists" (143). Congressmen may be taking their signals from California, where sociologist Wohlwill has found that, at least in the case of a referendum on a coastal zone regulation act, "support for an environmental protection measure cut across a wide spectrum of society," despite earlier sociological

research that suggested environmentalism was just an upper-middle-class, Democratic, if not an elite, social movement (201). So maybe time is on the side of environmentalism.

If in fact there has been an emerging American ecological conscience, it may be due in part to increased media attention to "the ecology beat." For example, in 24 sampled issues of the New York Times in 1962 there were 110 column inches of environmental news; fifteen years later the figure was 683. For the Chicago Tribune the comparable figures are even more striking: 1962, 70; 1977, 791 (117). If it did nothing else, by "officializing" environmentalism, the 1969 National Environmental Policy Act has given the press manifold "news pegs" on which to hang environmental reportage.

Are there any fundamental reasons why the environmental movement could be alive and kicking for a long time?

At the outset there is the high visibility of the basic problem. The issues confront young and old, farmers and city dwellers and suburban housewives, scientists and sportsmen, industrialists and workers. They all know mounting energy and pollution conundrums well. Newspaper readers, as we've said, are now well aware of environmental events that once went largely unreported.

Second, environmentalism is not alone; it is linked to a large infrastructure of old and new professional bureaus, voluntary organizations, and businesses. It inherits and enhances some political muscle, some financial wherewithall, and a good deal of experience at energizing public support. A whole battery of veteran and recruit public and private employees can't let environmentalism fade. For example, former Audubon field man Browder points out that key environmental activities were "all organized and active well before 1969-70" and are still viable--like "the League of Women Voters long campaign for water pollution control, parks and wilderness preservation fights, and coastal wetlands conflicts" (140). Pollution control spending from 1976 through 1985 may exceed $554 billion. That is 20 times the cost of the space program.

You may hear it said that the Achilles heel of environmentalism is that it's really not a coherent movement but at best is a very loose confederacy of assorted groups that at any given movement can spin off in counter-productive directions. But that very diversity inherent in the environmental movement bodes well for its survival. It is not a monoculture; no one artillery barrage can possibly wipe out all the groups marching to environmental drums. As California geographer Cooley says, "We have each approached the movement in our own way. It would be deadly if we were all on exactly the same wavelength" (167).

Fourth, environmentalism's tenure is assured in part because U.S. environmentalism is so at home, so indigenous. On the one hand, the environmental problem lends itself in part to technological solutions--gross scientific and engineering approaches. Americans are simply very good at big, massive engineering problems. Look what has happened just in the lifetime of adult Americans. We have lassoed the mountains and

deserts of the West with sinews of concrete and steel, for better or worse. We have inundated simultaneously the forces of Fascism on two continents with tons of tanks and howitzers and war planes. We have in turn revitalized whole continents with massive shipments of industrial know-how. And more recently we have gone to the moon, from hindsight almost as easily as a Sunday drive. We are simply superb at accepting big technological challenges and licking them.

Then, too, there is an ethical, or moral, dimension to the environmental movement which is also very American. This country was born as a moral movement. We made the conquest of Trans-Appalachia a moral movement. Its real leader was not Daniel Boone but John Wesley. Our great-grandfathers were taken up by an intense moral movement in the 1830's and 40's--the abolition movement. We didn't really start getting out of the Depression until we changed it from an economic problem to a moral movement. That was FDR's signal contribution. When he got up on that dark day in Washington and said, "We have nothing to fear but fear itself," he changed the whole gestalt, if you please, of the country. More recently we have experienced profoundly moral civil rights and anti-Vietnam movements. So, in the sense that environmentalism requires changes in standards, requires value judgments, requires, as Aldo Leopold said, the emergence of an ecological conscience, it is a moral or ethical movement, with a high survival value on the American landscape.

Nothing, to coin a phrase, succeeds like successes. Like the civil rights and Vietnam protest movements before it, the environmental movement has had its successes. You may call them picayune or you may call them impressive, depending on your perspective, but it cannot be denied that environmentalists do have a batch of victory medals on their chests. Great or small, the successes breed the sort of confidence it takes to keep any movement going. For example, environmentalists in action have led directly or indirectly to modifications, delays, or halts to assorted dams, canals, power plants, roads, ski resorts, golf courses, oil leases, pipelines, jetports, insecticides, and SST's; have spawned some 30 state environmental policy acts; have created an environmental press; have reformed public participation in policy formation, surprisingly enough on the part of the U.S. Army Corps of Engineers and the USDA Forest Service particularly; and have implanted environmental studies programs in just about every college and university in the country.

If anything, however, really speaks to the durability of environmentalism, it is the evidence from a study (144) that, for many young people, Earth-Day was not a momentary fling but an introduction to life careers in environmental action. It is incalculable, the effect of the presence of this maturing cohort in the crossroads and cosmopolitan centers of the country. As they move up the ladder of community involvement, these citizens can increasingly lend an environmental cast to resource management decision-making (1).

Drawing on a survey of such environmentalists themselves, Mitchell (105) believes environmentalism seems destined to a continued role as a reformist movement which harbors a vision of an "appropriate" society

for reforms that are neither too deep nor too left to alienate either its middle-class constituency or its potential allies among the less affluent members of society.

In such an environment, effective environmental communication may be achieved.

Yet can environmental communication really do any good? Communication research generally shows a positive relationship between communication media exposure and level of knowledge. But research also suggests that level of knowledge about a resource management issue may be inversely related to an ecological attitude on that issue when economic self-interest or some other stance intervenes.

If attitudes are not necessarily related to knowledge, long-term communication research also indicates that (a) salient attitudes are usually not subject to manipulation through short-term communication programs, and (b) that attitudes are unreliable predictors of actual behavior.

So where does all this leave us? Is environmental communication surely a journalism of futility? Can no one really change? Can a nation of go-getters cool their conspicuous consumption? Can a flow of environmental information have some impact?

That an individual can change there is some anecdotal evidence. Here, for example, are the words of a wildlife expert in the Southwest, vintage 1919:

> We have to understand the real destructiveness of predatory animals on game...No refuges or regulation of game kill will get us anywhere unless these predators are cleaned out...It is going to take patience and money to catch the last wolf or lion in New Mexico, but the last one must be caught!

And here are the words of a wildlife expert in 1949:

> The cowman who cleans his range of wolves does not realize that he is taking over the predator's job of trimming the herd to fit the range. He has not learned to think like a mountain. Hence we have dustbowls, and rivers washing the future into the sea...Perhaps this is behind Thoreau's dictum: in wildness is salvation of the world. Perhaps this is the hidden meaning in the howl of the wolf, long known among mountains, but seldom perceived among men.

The writer in both cases--Aldo Leopold (141). Something obviously happened to Aldo Leopold in those 30 years. He called it the arrival of an "ecological conscience." Environmental communication as education may have played a role.

We are often asked, "What was the single most effective environmental communication device or message of the past period?

Rachel Carson's Silent Spring in 1962 is often described as the firebell in the night that first alerted America to environmental hazards. It did that, but it was essentially a single-issue approach. Lynton Caldwell's "Environment: A New Focus on Public Policy" was a landmark paper, but it reached only a scholarly audience. So did the "Future Environments of North America" symposium in 1965. A unique joint House-Senate colloquium on "A National Policy for the Environment" in 1968 prodded Congress but received minimum press coverage. Big coverage of the Santa Barbara oil spill in 1969 some sociologists have said triggered massive environmental concern, and other sociologists attribute the rise of a public environmental awareness to Earth Day and its associated mass media splash.

But we would have to say the single most effective environmental communication message of the century was totally inadvertent--the 1969 view from the moon of a fragile, finite spaceship earth, fulfilling the description of Adlai Stevenson a decade before, that here we are, partners on a very small planet, with nothing between us and infinity but what we have and make of it. It was a powerful visual message, indeed, and Walter Cronkite and the CBS Evening News riveted it in our minds. By conquering the frontier of outer space we had discovered another frontier--the search for a state of harmony between humankind and the only earth we have.

Regardless of which of these devices or messages you consider the more compelling, you will notice they are all examples, not of environmental education in any formal sense, but of environmental communication as education.

In the final analysis, enlightened management for environmental sanity will proceed only as far and as fast as public opinion will sanction. For the most part, if anybody does, it will be the general public that will blow the whistle on pollution and energy waste. And to a significant degree it can be professional interpreters of environmental issues who may help affect public attitudes and actions, for good or ill. It has seemed to be so on the conservation front. It may be even more so in a day when public attitudes and actions are the heart of identifying environmental problems and arriving at solutions in tune with technological capabilities, general values, social objectives, and economic wherewithall.

In the words of the late Glenn Frank, the future of America may well be in the hands of the interpreter. Commoner thinks so:

> Public knowledge is essential to the solution of every environmental problem. In effect, the citizen faces an important question about modern technology: sooner or later, every human endeavor--if it is to continue--must pass this simple test: is it worth what it costs? These are value judgements, not determined by scientific principle. They are matters of morality, of social and political judgement. In a democracy they belong not in the hands of 'experts' but in the hands of the people (25).

Brubaker agrees:

> In a democracy like the United States, the first requirement for policy information is widespread public awareness of the nature of issue. While the technical complexities of environmental problems often are too much for the average citizen, the quality problem can be related in understandable terms to the nature and magnitude of our consumption, to the environmental standards we want to maintain, and to the kinds of trade-offs required to attain them (15).

In the broad, interpreters of environmental issues can play four principal roles: to reinforce public understanding of the ecological system of interlocking parts--humankind, culture, and natural environment; to deepen public knowledge of environmental problems--their nature and causes; to introduce concepts of multidisciplinary management that can help secure an environment fit for life and fit for living; and to involve people in ecological issues that will respond to citizen commitment and action (153). Environmental communicators assume there is a body of technological know-how and ecological attitudes that can help achieve a state of harmony between humankind and environment if people will but change their cultural values and engineering propensities. They try to explain the ecological principles, economic facts, engineering techniques, esthetic perceptions, and ethical standards that must undergird any search for environmental sanity. In essence, environmental communicators can help to lay a basis for action, to elucidate the choices in resource use and relate them to general values and social objectives, to prepare people for constructive change, and to suggest practical guidelines for the emergence of a viable ecological conscience (166).

ENVIRONMENTAL COMMUNICATION: A SUMMARY OF PROBLEMS AND PROMISES

What are some of the problems and possibilities associated with the process of environmental communication? Using as an outline the Hiebert-Ungureit-Bohn (72) model of the mass communication process, let us look in summary at the manifest contributions of, critical constraints on, and latent capabilities in the components of environmental communication.

Communicators

Mass communication begins with a communicator. In the environmental communication ecosystem there are five principal types: mass media personnel themselves, the I&E (information and education) people employed by resource management agencies at all echelons of government, the voices of conservation/environmental-action organizations, publicists for resource industries, and personnel on the staffs of formal and informal educationa institutions from universities to park visitor centers.

So diverse are these communicators that it is both difficult and dangerous to generalize about them, but this much might be said: first, from the perspective of history there have probably been few more dramatic examples of the response of mass communicators to a public problem than the irruption of environmental news in the 1965-1972 period; second, with some brilliant exceptions, these communicators often lack either adequate scientific background or adequate communications skills, depending on their affiliations; third, the thrust of their messages has been too much along the lines of over-simplified "search and destroy" missions against ecological or economic villains; and fourth, together they represent an as-yet largely untapped resource for stimulating, in our society, an orderly system of making environmental choices that has no precedent in all of human history (135).

Contents

A great deal of the recurrent complaining about environmental communicators stems from differing perceptions of the proper content of the mass media; that is, of their uses or functions. Depending on your particular posture, you may say the primary purpose is news and information, or analysis and interpretation, or education, or persuasion and public relations, or sales and advertising, or entertainment. The plain fact is that all mass media have always been and always will be used in all these ways by society. At any given moment the dominant function is a reflection of varying definitions and departures. In recent years any debate has centered largely around the divergent dogmas of advocacy and objectivity. The trouble may stem, principally from two problems; first, for any particular Seattle Post Intelligencer story on clear-cutting, for example, what is seen as objective reporting by the Sierra

Club will invariably be viewed as advocacy editorializing by Boise-Cascade, and vice versa; and second, there has been a tendency on the part of all the mass media in recent years to blur the distinctions in mechanical-presentation between so-called straight news and so-called commentary.

Codes

Mass media modify and expand the codes--the language and symbol systems--used in communication. The public has long been familiar, for example, with the effect of front-page headlines on our perception of what is important and even on what it means. We are only now becoming familiar with the effect of the TV camera on our perception of events. In a sense the only truly mass information media in the country are the 30-minute evening newscasts and related documentaries of the three national networks. To a significant degree what Americans know about environmental problems is what the ubiquitous tube has told them. This has been both boon and bane. Photogenic environmental insults like a Santa Barbara oil spill or a New York smog have been covered in technicolor, but less dramatic yet more pervasive degradations like creeping slurbs have been difficult to capture on film and even more difficult to interpret (107).

The print media have a related hang-up. Long practiced in covering momentary conflicts and conflagrations like football games and fires that start, flare up, and reach a conclusion before press time, newspapers and magazines have trouble lending to the quiet crises of environmentalism the type of low-key, sustained coverage the subject demands. Little wonder that readers have real difficulty sewing together a coherent understanding out of bits and patches of news.

Media coders tend to follow certain codes-within-codes, or news formulae. One basic news ingredient that tends to inflate environmental coverage is its inherent "conflict quotient." The heart of the environmental story is a form of war--mankind versus the elements, husbanders versus developers, conservation versus creature comforts. This all makes good copy.

On the other hand, a basic news ingredient that tends to deflate environmental coverage is its current lack of "personality." We have no O.J. Simpson or Billie Jean King or Henry Kissinger who personifies the subject. In the long run this lack of personality will probably be all to the good; at present it plagues headline coders and cameramen seeking human-interest angles and handy nicknames. Perhaps Ralph Nader will emerge as a personification of environmental concern. A spectator sport needs personalities, and that is what environmentalism is now--a spectator sport. When it becomes a participator sport it will acquire a news angle of its own.

News formulae, or "coders' codes," play a subtle yet sure role, then, in the environmental mass communication process. Another example:

The mass media are event-oriented (166). No event, no news. This coder's code complicates environmental coverage. An occasional approach

is to "stage" an event. E-Day was such a device. It is very easy to over-do creating events, however. Credibility declines quickly (169).

Another coder's code is the phenomenon known as "Afghanistanism," which decrees that if you are going to inveigh against a problem, make sure it is a far-away problem. This code is employed most commonly by editorial writers on small-city dailies. Afghanistanism may apply particularly to environmental issues (76). It is simply safer to attack a Corps of Engineers dam someplace than the smokestacks of a local industry.

Gatekeepers

To an extent not always fully appreciated, what are called gatekeepers control what we read and see, and how (54, 196). They are individuals within the media, like wire-service editors and TV continuity personnel, who make the decisions about communication content and coding.

On the basis of recent surveys, you cannot find a consensus as to what constitutes environmental news (61, 142, 190). At one pole is the gatekeeper with a boondock background who equates environmentalism only with open-country issues like soil erosion. At the opposite pole is the gatekeeper with an urban orientation who excludes conventional conservation issues from his definition of environmental news and thinks of it in terms largely of urban planning. In between are all sorts of intergrades. One can see how the tilt of a particular gatekeeper would markedly effect what gets top play in a particular paper on a particular day. In the absence of a consensus national environmental agenda, disparate gatekeepers would continue to have a disproportionate effect on what various audiences hear and see. If diversity is an ecological desideratum, we certainly seem to have it among gatekeepers.

The Media

Now we come to the principal media of communication themselves: books, booklets, newspapers, magazines, motion pictures, radio, television, and "others," the latter category including sound recording, direct mail, speeches, audiovisual materials, and data banks. Each uses, or is used by, the various communicators in the environmental communication ecosystem.

To a marked degree, professor speechmakers were the Jeremiahs of the first-generation environmental movement. Then book publishers became John the Baptists. At the same time specialized magazines began exploring the broader dimensions of conservation. General-circulation magazines later joined in. Brochures from government agencies and resource-related industries made their contribution. Newspapers were comparatively slow to latch onto the environmental story, but by 1971 environmental issues topped the list of editorial topics around the country. Famous TV voices climaxed the arrival of the environmental message.

Today, now that we know there are no easy solutions, only difficult questions, we are back at the stage where the second-generation environmental message is emanating largely from scientist speechmakers. The other media will gradually develop strategies to handle the various voices, but it will take time--and receptive audiences. Scientists, public and private, could help if they would exploit means of talking to publics instead of to themselves.

Regulators

The regulators of mass media, such as courts, government commissions, consumers, professional organizations, and public pressure groups, are external in the sense that they function outside the actual media systems, but through laws, rules, restrictions, and informal pressures they can impact on both the content and the structure of the media.

Three types of regulations have had a profound effect on the flow of environmental communication. First, the NEPA requirement for environmental impact statements has provided manifold grist for the news mill, particularly when accompanied by court challenges and counterchanges. Second, the failure of consumers to respond to some specialized environmental periodicals has markedly skewed the free flow of varied information. Third, the heavy hand of economic interests has in some cases suppressed hard-hitting environmental reportage.

To a degree, the quantity and quality of communication on any particular topic are regulated not so much by overt censorship as by covert neglect. For example, whereas environmental considerations were high on the agendas of the Roosevelts, Kennedy, and Johnson, they received short shrift from Nixon and Ford, and halting attention from Carter. In the absence of federal initiative, environmental mass communicators have a hard time "making news," except where local or state instrumentalities generate headlines.

On the other hand, while officials inside the federal Environmental Protection Agency concede that the ecological zeal of the early 1970's may have been tempered by the fuel-short and inflation-wracked 1980's, Administrator Douglas Costle says the past decade has also made his agency better prepared to argue its case effectively: "In 10 years we have become a seasoned, clearly more mature agency. The kind of regulatory and scientific analyses we are now doing are light years ahead of what they once were. And because of that we aren't losing many battles (29).

Filters

Among the most important components of the environmental communication process are filters--the eyes and ears through which we perceive the world--the products of our general culture system, the particular society or sub-culture in which we live, and our individual values and biases. These filters markedly effect what we think we see and hear, and even whether we hear or see anything.

A personal example:

The author is a country preacher's son. One of his father's favorite texts was that classic line from Isaiah: "Woe unto them that join house to house, that lay field to field, 'till there is no place where one may be alone in the midst of the earth." The author grew up with a trout rod and a .22. His favorite authors are Thoreau, Muir, and Leopold. His life reaches a zenith in a saltmarsh duck blind or on a mountain meadow. So in any environmental controversy over whether or not to set aside timbered land for wilderness, he filters out all multiple-use appeals as mere "propaganda" and comes out four-square for wilderness. (Although he was happy to be able to enlarge his backwoods cabin with a thousand dollars' worth of Potlach plywood from a multiple-use Idaho forest.)

Filters are ubiquitous. Probably the most compelling filter effecting environmental mass communication today is a complex of life-style and economics. Most Americans are not hearing the hard-core environmental message very well because it so often conflicts at the moment with their comfort, their cars, and their careers.

We are probably a generation away from a business community that has figured out how to make money out of conservation, and a labor community that will strike for environmental health. The speed with which we approach an ecological society may well hinge on the effectiveness of environmental mass communication in the decade ahead. We cannot risk an environmental Pearl Harbor to accelerate the process.

The filter problem is in large measure responsible for the rise of the public relations profession, devoted to getting others to see the world as one's sponsor sees it. To do this the PR man structures a message in a particular manner in order to try to assure that the right image of the sender penetrates the filters of the receiver. The PR-type environmental message is epitomized, on the one hand, by Weyerhauser's long-time series of institutional advertisements, and on the other by the journal of Friends of the Earth, Not Man Apart. When the public is lucky, such competing PR messages stimulate good, objective, investigative reporting, like John Mitchell's classic article in Audubon, "Best of the S.O.B.'s," in which both George Weyerhauser and David Brower come out as neither saints nor sinners but as strong individuals following divergent stars. It is this kind of reporting, laying out alternatives and consequences for public choice, that we badly need more of in environmental mass communication.

Audiences

The receivers of messages--the audiences--are modified by the media and in turn modify the process. No one mass audience of our media system exists, but rather a variety of audiences exist for each medium. All of us are members of a large number of audiences, and each audience member reacts individually. Such reaction is similar, however, to that of other audience members who have shared common experiences and are

influenced by the same social relationships. As a result of being a member of an audience, an individual may be changed by the total media experience.

All these audience characteristics effect environmental communication in a number of ways. First, the one-medium message misses many. Second, the one-audience message misses many. Particularly, a sustained multi-media message can create a sustained audience which in turn can create media and messages which in turn can reinforce the audience.

For example: Rachel Carson's 1960 series in the New Yorker reached only a hundred thousand. Her paperback Silent Spring reached a million. Reinforced by local newspaper and TV coverage of dead robins and disappearing duck hawks, the DDT story picked up steam, energizing the recrudescence of the Audubon Society, creating a new audience for its journal, an audience demanding action as well as words. In response the Audubon Society subsidized a new Environmental Defense Fund, and its suits generated more mass media coverage, leading to government controls on persistent pesticides. So the ghost of a single biologist is now doing battle with Northwest foresters over whether or not to spray the tussock moth (14).

Feedback, Noise, Amplification

Feedback is the communicated response of the audience to the message. Feedback enables the communicator to alter his or her message. In mass communication, feedback is delayed, diffused, and difficult to evaluate. Nielsen ratings, letters to the editor, surveys--each has its debilities. The ultimate decision is rendered in our society by consumers and their pocketbooks or their votes. On that score the environmental message track record is mixed. Of the 14 specialized new periodicals born in response to environmentalism 10 years ago, half are already dead and buried. On the other hand, environmentalism has led to a significant re-tailoring of the editorial formulae of a half-dozen established periodicals.

Noise effects environmental communication. We are not talking so much about obvious interference like radio static, TV flip-flops, illegible printing, or snailspace mails as about interference from competing stimuli. For example, on E-Day April 22, 1970, many of us believed the environmental message was just beginning to come into its own. From hindsight we can now see E-Day actually represented the crest of the wave, at least for a time. Why? Because of the overpowering competition supplied in turn by Cambodia, Watergate, stagflation, OPEC, and Iran. Environmental messages that came through loud and clear 10 years ago are drowned out today by environmental noise.

Environmentalists sometimes create their own noise by insisting on talking in technical terms that may reinforce their scientific respectability but fail completely to communicate elementary concepts to laymen. Obviously there is a line that separates essential accuracy from over-simplification, but the scientist/administrator is frequently too strict in his requirements for detail, qualification, and reservation. The resulting message is largely static (10).

Communicators sometimes create noise of quite a different sort. They insist on turning profound environmental messages into light, chatty slogans of no substance, or in reiterating yesterday's messages whether or not they are relevant to today's issues. Smoky Bear, for example, has not been allowed to say anything new for 20 years. How much more effective it would have been if the highly credible Smoky had become the environmental voice of the U.S. Forest Service, instead of having that role assigned to a frivolous owl.

The mass media amplify messages, not only physically but psychologically, in that anything the media focus attention on becomes news. When the media focus on the same message heavily and simultaneously, the snowball or bandwagon effect can be overpowering. This is what happened in late 1969 and early 1970 when virtually all the paperback, magazine, newspaper, and TV gatekeepers seized on the E-Day message as the big story. What got the media onto the population-pollution story so completely and compellingly? It is probably not without significance that key gatekeepers are concentrated in the country's most populated and polluted places--New York and Los Angeles.

In turn the mass media can de-amplify messages. Right now many Americans undoubtedly think the quest for environmental quality is no longer urgent because by and large media coverage of the topic has slacked off, at least on page 1.

What of the Future?

The American environmental communication process we have just examined is, of course, as full of holes as Swiss cheese. You can view this situation in two ways. On the one hand you can complain the system can't work. On the other hand, you can rejoice in its frailties. Certainly there is no way for anybody consistently to control the mass communication process in this country. That is all to the good. Yet the potential is there for a crucial collective contribution.

Having looked at some of the problems inherent in the environmental communication process, let us conclude with some possible promising improvements:

Within the media the emergence of specialized environmental reporters is an encouraging development. These new-breed communicators are beginning to lend to environmental interpretation the sort of perspective and continuity we associate with coverage of sports and the stock market. Outside the media we are beginning to see the emergence of environmental scientists with a bent toward effective communicating. Hopefully their colleagues will permit them to talk to the public without impuning their scholarly credentials.

To protect the media from contamination and the public from bias, we can employ improved "truth in information-packaging" principles that will distinguish more clearly between straight news and commentary. In selecting what gets printed or aired, some gatekeepers are beginning to assume a responsibility for public agenda-setting, rather than merely

reflecting internal codes and external whims. Environmental coverage may benefit from any such stance.

To disseminate sophisticated environmental messages, new communications technology is emerging: state ETV networks, video cassettes, cable TV, the so-called Home Information Utility Coaxial cable, and satellite-based international broadcasting. The possibilities are challenging for a vastly broader environmental mass communication ecosystem. Professional rewards "regulate" mass communications; Pulitzer-type prizes have a marked effect on reporting standards. Hence environmental groups are instituting means of recognizing outstanding mass communication performances.

The filter phenomenon means that while environmental communication can serve as an alert mechanism, it must be reinforced by economic sticks and esthetic carrots if we are in fact to convert environmental awareness into environmental behavior. For example, the Minnesota legislature has hammered out a double-barrelled law that will provide fast tax writeoffs for industries installing pollution-abatement facilities, and will provide special unemployment compensation for workers displaced by bona fide environmental decisions.

Only an audience can sustain the environmental message. While it may be unfortunate that so many specialized environmental periodicals have foundered, it is interesting that a half-dozen seem to have established ecological niches for themselves, sometimes with timely foundation subsidy. Without question we need more refined, responsive feedback mechanisms in the environmental mass communication process. Public pressure may be about to require something of the sort. Under the rubric of so-called "equal time" or "right of reply" principles, the public may gain somewhat increased access to the mass media. Without question the environmental message would take on renewed audibility were rumors of wars to cease, the price of hamburger to nose-dive, and paychecks to fatten. That's a tall order. In the meantime resource managers could help mightily by eliminating the circumlocucious static that encumbers so many official environmental messages (151).

Were all these promises inherent in the environmental communication ecosystem to come to pass, what could be the upshot? The ideal is an open marketplace of ideas, with communicators of varying persuasions vying for attention, promoting varying options, and contributing to a mass facility with the democratic decision-making process. It is the making of sophisticated choices, the rendering of subtle value judgments, that is the essence of conservation today. Environmental communication can help attain a good old American objective--to reinforce more freedom of choice. The citizen who wants to conserve can be given more chance to conserve--in the marketplace, in the home, at the ballotbox. The environmental communication ecosystem may increasingly be put to the test of discovering and outlining viable options in an unemotional, objective, self-disciplined manner. If expertise comes wrapped in superficiality, pretentiousness, over-emotion, or even intellectual dishonesty, moral insult is added to environmental injury.

And environmental communication could go beyond the outlining of options to helping develop a mass facility with the decision-making process itself--the environmental communication ecosystem coming of age.

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